oxo process [CHEM ENG] Catalytic process for production of alcohols, aldehydes, and other oxygenated organic compounds by reaction of olefin vapors with carbon monoxide and hydrogen. { 'äk·sō ˌprä·səs }

oxyacetylene cutting [ENG] The flame cutting of ferrous metals in which the preheating of the metal is accomplished with a flame produced by an oxyacetylene torch. Also known as acetylene cutting. { ¦äk·sē·ə'sed·əlˌēn ¦kəd·iŋ }

oxyacetylene torch [ENG] A torch that mixes acetylene and oxygen to produce a hot flame for the welding or cutting of metal. Also known as acetylene torch. { ¦äk·sē·ə'sed·əlˌēn ¦tȯrch }

oxyamination *See* ammoxidation. { ¦äk·sēˌam·ə'nā·shən }

oxygen bomb calorimeter [ENG] Device to measure heat of combustion; the sample is burned with oxygen in a closed vessel, and the temperature rise is noted. { 'äk·sə·jən 'bäm ˌkal·ə'rim·əd·ər }

oxygen cutting [ENG] Any of several types of cutting processes in which metal is removed with or without a flux by a chemical reaction of the base metal with oxygen at high temperatures. { 'äk·sə·jən ˌkəd·iŋ }

oxygen-kerosine burner [ENG] Liquid-fuel device using a mixture of oxygen and vaporized or atomized kerosine for combustion. { 'äk·sə·jən 'ker·əˌsēn ˌbərn·ər }

oxygen mask [ENG] A mask that covers the nose and mouth and is used to administer oxygen. { 'äk·sə·jən ˌmask }

oxygen point [THERMO] The temperature at which liquid oxygen and its vapor are in equilibrium, that is, the boiling point of oxygen, at standard atmospheric pressure; it is taken as a fixed point on the International Practical Temperature Scale of 1968, at −182.962°C. { 'äk·sə·jən ˌpȯint }

oxyl process [CHEM ENG] Modified Fischer-Tropsch process used to make alcohols, other oxygenated compounds, paraffins, and olefin hydrocarbons from carbon monoxide and hydrogen. { 'äk·səl ˌprä·səs }

oz *See* ounce.

oz ap *See* ounce.

oz apoth *See* ounce.

ozone generator [ENG] Apparatus that converts oxygen, O_2, into ozone, O_3, by subjecting the oxygen to an electric-brush discharge. Also known as ozonizer. { 'ōˌzōn ˌjen·əˌrād·ər }

ozonizer *See* ozone generator. { 'ōˌzōˌnīz·ər }

oz t *See* ounce.

oz tr *See* ounce.

P

Pa *See* pascal.

pace rating *See* effort rating. { 'pās ˌrād·iŋ }

pachimeter [ENG] An instrument for measuring the limit beyond which shear of a solid ceases to be elastic. { pə'kim·əd·ər }

Pachuca tank [CHEM ENG] Air-agitated, solid-liquid mixing vessel in which the air is injected into the bottom of a center draft tube; air and solids rise through the tube, with solids exiting the top of the tube and falling through the bulk of the liquid. { pə'chü·kə ˌtaŋk }

pachymeter [ENG] An instrument used to measure the thickness of a material, for example, a sheet of paper. { pə'kim·əd·ər }

pack [IND ENG] To provide protection for an article or group of articles against physical damage during shipment; packing is accomplished by placing articles in a shipping container, and blocking, bracing, and cushioning them when necessary, or by strapping the articles or containers on a pallet or skid. { pak }

packaged circuit *See* rescap. { 'pak·ijd ˌsər·kət }

package freight [IND ENG] Freight shipped in lots insufficient to fill a complete car; billed by the unit instead of by the carload. { 'pak·ij ˌfrāt }

packaging [ELEC] The process of physically locating, connecting, and protecting devices or components. { 'pak·ə·jiŋ }

packaging density [ELECTR] The number of components per unit volume in a working system or subsystem. { 'pak·ə·jiŋ ˌden·səd·ē }

packed bed [CHEM ENG] A fixed layer of small particles or objects arranged in a vessel to promote intimate contact between gases, vapors, liquids, solids, or various combinations thereof; used in catalysis, ion exchange, sand filtration, distillation, absorption, and mixing. { 'pakt 'bed }

packed tower [CHEM ENG] A fractionating or absorber tower filled with small objects (packing) to bring about intimate contact between rising fluid (vapor or liquid) and falling liquid. { 'pakt 'taü·ər }

packed tube [CHEM ENG] A pipe or tube filled with high-heat-capacity granular material; used to heat gases when tubes are externally heated. { 'pakt 'tüb }

packer [ENG] A device that is inserted into a hole being grouted to prevent return of the grout around the injection pipe. { 'pak·ər }

packing [ENG] *See* stuffing. [ENG ACOUS] Excessive crowding of carbon particles in a carbon microphone, produced by excessive pressure or by fusion particles due to excessive current, and causing lowered resistance and sensitivity. { 'pak·iŋ }

packing density [ELECTR] The number of devices or gates per unit area of an integrated circuit. { 'pak·iŋ ˌden·səd·ē }

packing ring *See* piston ring. { 'pak·iŋ ˌriŋ }

pad [ELECTR] **1.** An arrangement of fixed resistors used to reduce the strength of a radio-frequency or audio-frequency signal by a desired fixed amount without introducing appreciable distortion. Also known as fixed attenuator. **2.** *See* terminal area. [ENG] **1.** A layer of material used as a cushion or for protection. **2.** A projection of excess metal on a casting forging, or welded part. **3.** An area within an airstrip or airway that is used for warming up the motors of an airplane before takeoff. **4.** A block of stone or masonry set on a wall to distribute a load that is concentrated at that portion of the wall. Also known as padstone. **5.** That portion of an airstrip or airway from which an airplane leaves the ground on takeoff or first touches the ground on landing. **6.** *See* helipad. { pad }

paddle [DES ENG] Any of various implements consisting of a shaft with a broad, flat blade or bladelike part at one or both ends. { 'pad·əl }

paddle wheel [MECH ENG] **1.** A device used to propel shallow-draft vessels, consisting of a wheel with paddles or floats on its circumference, the wheel rotating in a plane parallel to the ship's length. **2.** A wheel with paddles used to move leather in a processing vat. { 'pad·əl ˌwēl }

padlock [DES ENG] An unmounted lock with a shackle that can be opened and closed; the shackle is usually passed through an eye, then closed to secure a hasp. { 'padˌläk }

pail [DES ENG] A cylindrical or slightly tapered container. { pāl }

pair [ELEC] Two like conductors employed to form an electric circuit. [MECH ENG] Two parts in a kinematic mechanism that mutually constrain relative motion; for example, a sliding pair composed of a piston and cylinder. { per }

pairing element [MECH ENG] Either of two machine parts connected to permit motion. { 'per·iŋ ˌel·ə·mənt }

palladium barrier leak detector [ENG] A type of leak detector in which hydrogen is diffused through a barrier of hot palladium into an evacuated vacuum gage. { pəˈlād·ē·əm 'bar·ē·ər 'lēk diˌtek·tər }

pallet [BUILD] A flat piece of wood laid in a wall to which woodwork may be securely fastened. [ENG] **1.** A lever that regulates or drives a ratchet wheel. **2.** A hinged valve on a pipe organ. **3.** A tray or platform used in conjunction with a fork lift for lifting and moving materials. [MECH ENG] One of the disks or pistons in a chain pump. { 'pal·ət }

palletize [IND ENG] To package material for convenient handling on a pallet or lift truck. { 'pal·əˌtīz }

pall ring [CHEM ENG] A specially shaped steel ring used as packing for distillation columns. { 'pȯl ˌriŋ }

palpable coordinate [MECH] A generalized coordinate that appears explicitly in the Lagrangian of a system. { 'pal·pə·bəl kōˈȯrd·ən·ət }

pan bolt [DES ENG] A bolt with a head resembling an upside-down pan. { 'pan ˌbōlt }

pancake auger [DES ENG] An auger having one spiral web, 12 to 15 inches (30 to 38 centimeters) in diameter, attached to the bottom end of a slender central shaft; used as removable deadman to which a drill rig or guy line is anchored. { 'panˌkāk ˌȯg·ər }

pancake engine [MECH ENG] A compact engine with cylinders arranged radially. { 'panˌkāk ˌen·jən }

pan conveyor [MECH ENG] A conveyor consisting of a series of pans. { 'pan kənˌvā·ər }

pan crusher [MECH ENG] Solids-reduction device in which one or more grinding wheels or mullers revolve in a pan containing the material to be pulverized. { 'pan ˌkrəsh·ər }

pane [BUILD] A sheet of glass in a window or door. [DES ENG] One of the sides on a nut or on the head of a bolt. { pān }

panel [CIV ENG] **1.** One of the divisions of a lattice girder. **2.** A sheet of material held in a frame. **3.** A distinct, usually rectangular, raised or sunken part of a construction surface or a material. [DES ENG] *See* frog. [ENG] A metallic or nonmetallic sheet on which operating controls and dials of an electronic unit or other equipment are mounted. { 'pan·əl }

panel board [ELEC] *See* control board. [ENG] A drawing board with an adjustable outer frame that is forced over the drawing paper to hold and strain it. { 'pan·əl ˌbȯrd }

panel coil *See* plate coil. { 'pan·əl ˌkȯil }

panel cooling [CIV ENG] A system in which the heat-absorbing units are in the ceiling, floor, or wall panels of the space which is to be cooled. { 'pan·əl ˌkül·iŋ }

panel heating [CIV ENG] A system in which the heat-emitting units are in the ceiling, floor, or wall panels of the space which is to be heated. { 'pan·əl ˌhēd·iŋ }

panel length [CIV ENG] The distance between adjacent joints on a truss, measured along the upper or lower chord. { 'pan·əl ˌleŋkth }

panel point [CIV ENG] The point in a framed structure where a vertical or diagonal member and a chord intersect. { 'pan·əl ˌpȯint }

panel system [BUILD] A wall composed of factory-assembled units connected to the building frame and to each other by means of anchors. { 'pan·əl ˌsis·təm }

panel wall [BUILD] A nonbearing partition between columns or piers. { 'pan·əl ˌwȯl }

pan head [DES ENG] The head of a screw or rivet in the shape of a truncated cone. { 'pan ˌhed }

panic exit device [ENG] A locking device installed on an exit door to release the latch when the crash bar is pushed. Also known as fire-exit bolt; panic hardware. { ˈpan·ik ˈeg·zit diˌvīs }

panic hardware *See* panic exit device. { 'pan·ik ˌhärdˌwer }

pannier *See* gabion. { 'pan·yər }

panoramic radar [ENG] Nonscanning radar which transmits signals over a wide beam in the direction of interest. { ˌpan·əˈram·ik 'rāˌdär }

pan tank *See* rundown tank. { 'pan ˌtaŋk }

pantograph [ENG] A device that sits on the top of an electric locomotive or cars in an electric train and picks up electricity from overhead wires to run the train. { 'pan·təˌgraf }

pantography [ENG] System for transmitting and automatically recording radar data from an indicator to a remote point. { panˈtäg·rə·fē }

pantometer [ENG] An instrument that measures all the angles necessary for determining distances and elevations. { panˈtäm·əd·ər }

paper cutter [DES ENG] A hand-operated device to cut and trim paper, consisting of a cutting blade bolted at one end to a ruled board; when the blade is drawn flush with the board, which has a metal strip at the cutting edge, a shearing action takes place which cuts the paper cleanly and evenly. { 'pā·pər ˌkəd·ər }

paper machine [MECH ENG] A synchronized series of mechanical devices for transforming a dilute suspension of cellulose fibers into a dry sheet of paper. { 'pā·pər məˌshēn }

paper mill [IND ENG] A building or complex of buildings housing paper machines. { 'pā·pər ˌmil }

parabolic microphone [ENG ACOUS] A microphone used at the focal point of a parabolic sound reflector to give improved sensitivity and directivity, as required for picking up a band marching down a football field. { ˌpar·əˈbäl·ik 'mīˌkrəˌfōn }

paraboloid [ENG] A reflecting surface which is a paraboloid of revolution and is used as a reflector for sound waves and microwave radiation. { pəˈrab·əˌlȯid }

parabomb [ENG] An equipment container with a parachute which is capable of opening automatically after a delayed drop. { 'par·əˌbäm }

paracentric [DES ENG] Pertaining to a key and keyway with longitudinal ribs and grooves that project beyond the center, as used in pin-tumbler cylinder locks to deter lockpicking. { ¦par·ə¦sen·trik }

parachute flare [ENG] Pyrotechnic device attached to a parachute and designed to provide intense illumination for a short period; it may be discharged from aircraft or from the surface. { 'par·əˌshüt ˌfler }

parachute radiosonde *See* dropsonde. { ¦par·əˌshüt 'rād·ēˌsänd }

parachute weather buoy [ENG] A general-purpose automatic weather station which can be air-dropped; it is 10 feet (3 meters) long and 22 inches (56 centimeters) in diameter, and is designed to operate for 2 months on a 6-hourly schedule, transmitting station identification, wind speed, wind direction, barometric pressure, air temperature, and sea-water temperature. { 'par·əˌshüt 'weth·ər ˌbói }

paracrate [ENG] Rigid equipment container for dropping equipment from an airplane by parachute. { 'par·əˌkrāt }

paraffin press [ENG] A filter press used during petroleum refining for the separation of paraffin oil and crystallizable paraffin wax from distillates. { 'par·ə·fən ˌpres }

parallel [ELEC] Connected to the same pair of terminals. Also known as multiple; shunt. { 'par·əˌlel }

parallel axis theorem [MECH] A theorem which states that the moment of inertia of a body about any given axis is the moment of inertia about a parallel axis through the center of mass, plus the moment of inertia that the body would have about the given axis if all the mass of the body were located at the center of mass. Also known as Steiner's theorem. { 'par·əˌlel ¦ak·səs ˌthir·əm }

parallel baffle muffler [DES ENG] A muffler constructed of a series of ducts placed side by side in which the duct cross section is a narrow but long rectangle. { 'par·əˌlel ¦baf·əl 'məf·lər }

parallel circuit [ELEC] An electric circuit in which the elements, branches (having elements in series), or components are connected between two points, with one of the two ends of each component connected to each point. { 'par·əˌlel 'sər·kət }

parallel compensation *See* feedback compensation. { 'par·əˌlel ˌkäm·pən'sā·shən }

parallel cut [ENG] A group of parallel holes, not all charged with explosive, to create the initial cavity to which the loaded holes break in blasting a development round. Also known as burn cut. { 'par·əˌlel 'kət }

parallel drum [DES ENG] A cylindrical form of drum on which the haulage or winding rope is coiled. { 'par·əˌlel 'drəm }

parallel firing [ENG] A method of connecting together a number of detonators which are to be fired electrically in one blast. { 'par·əˌlel 'fīr·iŋ }

parallel flow [ELEC] Also known as loop flow. **1.** The flow of electric current from one point to another in an electric network over multiple paths, in accordance with Kirchhoff's laws. **2.** In particular, the flow of electric current through electric power systems over paths other than the contractual path. { 'par·əˌlel 'flō }

parallel gripper [CONT SYS] A robot end effector made up of two jawlike components that grasp objects. { 'par·əˌlel 'grip·ər }

parallel linkage [MECH ENG] An automotive steering system that has a short idler arm mounted parallel to the pitman arm. { ¦par·əˌlel 'liŋ·kij }

parallel-plate reactor [ENG] A type of plasma reactor in which a process gas is introduced into the space between two closely spaced parallel plane electrodes, and a plasma, generated by a radio-frequency excitation applied to the electrodes, acts directly on substrates placed on either electrode. { ¦par·əˌlel 'plāt rēˌak·tər }

parallel reliability [SYS ENG] Property of a system composed of functionally parallel elements in such a way that if one of the elements fails, the parallel units will continue to carry out the system function. { 'par·əˌlel riˈlī·əˌbil·əd·ē }

parallels [ENG] **1.** Spacers located between steam plate and press platen of the mold to prevent bending of the middle section. **2.** Spacers or pressure pods located between steam plates of a mold to regulate height and prevent crushing of mold parts. { 'par·əˌlelz }

parallel series [ELEC] Circuit in which two or more parts are connected together in parallel to form parallel circuits, and in which these circuits are then connected together in series so that both methods of connection appear. [ENG] *See* multiple series. { 'par·əˌlel 'sir·ēz }

parallel shot [ENG] In seismic prospecting, a test shot which is made with all the amplifiers connected in parallel and activated by a single geophone so that lead, lag, polarity, and phasing in the amplifier-to-oscillograph circuits can be checked. { 'par·əˌlel 'shät }

parameter identification [SYS ENG] The problem of estimating the values of the parameters that govern a dynamical system from data on the observed behavior of the system. { 'pəˈram·əd·ər īˌdent·ə·fəˈkā·shən }

parametric equalizer [ENG ACOUS] A device that allows control over the center frequencies, bandwidths, and amplitudes (parameters) of band-pass filters that determine the frequency response of audio equipment. { ¦par·ə¦me·trik ˌē·kwəˈlīz·ər }

parametric excitation [ENG] The method of exciting and maintaining oscillations in either an electrical or mechanical dynamic system, in which excitation results from a periodic variation in an energy storage element in a system such as a capacitor, inductor, or spring constant. { ¦par·ə¦me·trik ˌek·siˈtā·shən }

parametrized voice response system [ENG ACOUS] A voice response system which first extracts informative parameters from human speech, such as natural resonant frequencies (formants) of the speaker's vocal tract and the

fundamental frequency (pitch) of the voice, and which later reconstructs speech from such stored parameters. { pə'ram·ə,trīzd 'vōis ri,spänz ,sis·təm }

parapack [ENG] A package or bundle with a parachute attached for dropping from an aircraft. { 'par·ə,pak }

parasitic [ELECTR] An undesired and energy-wasting signal current, capacitance, or other parameter of an electronic circuit. { ¦par·ə¦sid·ik }

parasitic current [ELEC] An eddy current in a piece of electrical machinery; gives rise to energy losses. { ¦par·ə¦sid·ik 'kə·rənt }

paravane [ENG] A torpedo-shaped device with sawlike teeth along its forward end, towed with a wire rope underwater from either side of the bow of a ship to cut the cables of anchored mines. Also known as otter. { 'par·ə,vān }

Pareto diagram [IND ENG] A histogram of defects or quality problems, classified by type and sorted in the order of descending frequency, that is used to focus on the major sources of problems. { pä'rе·tō ,di·ə,gram }

Pareto's law [IND ENG] The principle that in most activities a small fraction (around 20%) of the total activity accounts for a large fraction (around 80%) of the result. Also known as rule of 80-20. { pə'rēd·ōz ,lò }

parging [CIV ENG] A thin coating of mortar or plaster on a brick or stone surface. { 'pärj·iŋ }

paring [MECH ENG] A method of wood turning in which the piece is trimmed or reduced in size by cutting or shaving thin sections from the surface. { 'per·iŋ }

paring chisel [DES ENG] A long-handled chisel used to pare wood manually. { 'per·iŋ ,chiz·əl }

paring gouge [DES ENG] A long, thin concave woodworker's gouge with the cutting edge beveled on the inside of the blade. { 'per·iŋ ,gaùj }

parison [ENG] A hollow plastic tube from which a bottle or other hollow object is blow-molded. { 'par·ə·sən }

parison swell [ENG] In blow molding, the ratio of the cross-sectional area of the parison to that of the die opening. { 'par·ə·sən ,swel }

parking apron [CIV ENG] A hard-surfaced area used for parking aircraft. { 'pärk·iŋ ,ā·prən }

parking brake [MECH ENG] In an automotive vehicle, a brake that functions independently of the service brake and is set after the vehicle has been brought to a stop. { 'pärk·iŋ ,brāk }

parking lot [CIV ENG] An outdoor lot for parking automobiles. { 'pärk·iŋ ,lät }

parkway [CIV ENG] A broad landscaped expressway which is not open to commercial vehicles. { 'pärk,wā }

parquet flooring [BUILD] Wood flooring made of strips laid in a pattern to form designs. { pär'kā 'flòr·iŋ }

Parshall flume [ENG] A calibrated device for measuring the flow of liquids in open conduits by measuring the upper and lower beads at a specified distance from an obstructing sill. { 'pär·shəl ,flüm }

Parsons-stage steam turbine [MECH ENG] A steam turbine having a reaction-type stage in which the pressure drop occurs partially across the stationary nozzles and partly across the rotating blades. { 'pär·sənz ¦stāj 'stēm 'tər·bən }

part [ENG] An element of a subassembly, not normally useful by itself and not amenable to further disassembly for maintenance purposes. { pärt }

part classification [IND ENG] A coding scheme employed in automated manufacturing processes that uses four or more digits to assign discrete products to families of parts. { 'pärt ,klas·ə·fə,kā·shən }

part detection [IND ENG] The recognition of parts and workpieces by a robot or a computer vision system. { 'pärt di,tek·shən }

part family [IND ENG] In the group technology concept, a set of related parts that can be produced by the same sequence of machining operations because of similarity in shape and geometry or similarity in production operation processes. { 'pärt ,fam·lē }

partial condensation [CHEM ENG] The cooling (or pressurization) of a saturated vapor until a part of it is condensed out as liquid. { 'pär·shəl ,känd·ən'sā·shən }

particle *See* material particle. { 'pärd·ə·kəl }

particle dynamics [MECH] The study of the dependence of the motion of a single material particle on the external forces acting upon it, particularly electromagnetic and gravitational forces. { 'pärd·ə·kəl dī,nam·iks }

particle energy [MECH] For a particle in a potential, the sum of the particle's kinetic energy and potential energy. { 'pärd·ə·kəl ,en·ər·jē }

particle image velocimetry [ENG] A method of measuring local fluid velocities at thousands of locations in a fluid flow by optically observing large numbers of particles that are suspended in the fluid and move with it, using a photograph of the flow illuminated by two or more successive pulses of light or continuously for a known time interval. Also known as particle tracking velocimetry. { ,pärd·i·kəl ,im·ij ,vel·ə'säm·ə·trē }

particle mechanics [MECH] The study of the motion of a single material particle. { 'pärd·ə·kəl mi,kan·iks }

particle-size analysis [ENG] Determination of the proportion of particles of a specified size in a granular or powder sample. { 'pärd·ə·kəl ¦sīz ə,nal·ə·səs }

particle-size distribution [ENG] The percentages of each fraction into which a granular or powder sample is classified, with respect to particle size, by number or weight. { 'pärd·ə·kəl ¦sīz ,di·strə'byü·shən }

particle tracking velocimetry *See* particle image velocimetry. { ¦pärd·ə·kəl ¦trak·iŋ ,vel·ə'sim·ə·trē }

particulate mass analyzer [ENG] A unit which measures dust concentrations in emissions from furnaces, kilns, cupolas, and scrubbers. { pär'tik·yə·lət 'mas 'an·ə,līz·ər }

parting stop [BUILD] A thin strip of wood that

separates the sashes in a double-hung window. { 'pärd·iŋ ˌstäp }

parting tool [DES ENG] A narrow-bladed hand tool with a V-shaped gouge used in woodworking for cutting grooves and in wood turning for cutting a piece in two. Also known as V-tool. { 'pärd·iŋ ˌtül }

partition [BUILD] An interior wall having a height of one story or less, which divides a structure into sections. [IND ENG] A slotted sheet of paperboard that can be assembled with similar sheets to form cells for holding goods during shipment. { pär'tish·ən }

part programming [CONT SYS] The planning and specification of the sequence of steps or events in the operation of a numerically controlled machine tool. { 'pärt ˌprō,gram·iŋ }

parts kit [ENG] A group of parts, not all having the same basic name, used for repair or replacement of the worn broken parts of an item; it may include instruction sheets and material, such as sandpaper, tape, cement, and gaskets. { 'pärts ˌkit }

parts list [ENG] One or more printed sheets showing a manufacturer's parts or assemblies of an end item by illustration or a numerical listing of part numbers and names; it does not outline any assembly, maintenance, or operating instructions, and it may or may not have a price list cover sheet. { 'pärts ˌlist }

party wall [BUILD] A wall providing joint service between two buildings. { 'pärd·ē ˌwȯl }

pascal [MECH] A unit of pressure equal to the pressure resulting from a force of 1 newton acting uniformly over an area of 1 square meter. Symbolized Pa. { pa'skal }

pass [MECH ENG] **1.** The number of times that combustion gases are exposed to heat transfer surfaces in boilers (that is, single-pass, double-pass, and so on). **2.** In metal rolling, the passage in one direction of metal deformed between rolls. **3.** In metal cutting, transit of a metal cutting tool past the workpiece with a fixed tool setting. { pas }

passband [ELECTR] A frequency band in which the attenuation of a filter is essentially zero. { 'pasˌband }

pass-by [ENG] The double-track part of any single-track system of rail transport. { 'pasˌbī }

passenger car [ENG] **1.** A railroad car in which passengers are carried. **2.** An automobile for carrying as many as nine passengers. { 'pas·ən·jər ˌkär }

passing track [ENG] A sidetrack with switches at both ends. { 'pas·iŋ ˌtrak }

passivation [ELECTR] Growth of an oxide layer on the surface of a semiconductor to provide electrical stability by isolating the transistor surface from electrical and chemical conditions in the environment; this reduces reverse-current leakage, increases breakdown voltage, and raises power dissipation rating. { ˌpas·ə'vā·shən }

passive accommodation [CONT SYS] The alteration in the positioning or motion of the end point of a robot manipulator that results from bending or deforming of the manipulator components in response to forces exerted on the robot. { 'pas·iv əˌkäm·ə'dā·shən }

passive AND gate [ELECTR] *See* AND gate. [ENG] A fluidic device which achieves an output signal, by stream interaction, only when both of two control signals appear simultaneously. { 'pas·iv 'and ˌgāt }

passive component *See* passive element. { 'pas·iv kəm'pō·nənt }

passive earth pressure [CIV ENG] The maximum value of lateral earth pressure exerted by soil on a structure, occurring when the soil is compressed sufficiently to cause its internal shearing resistance along a potential failure surface to be completely mobilized. { 'pas·iv 'ərth ˌpresh·ər }

passive element [ELEC] An element of an electric circuit that is not a source of energy, such as a resistor, inductor, or capacitor. Also known as passive component. { 'pas·iv 'el·ə·mənt }

passive method [CIV ENG] A construction method in permafrost areas in which the frozen ground near the structure is not disturbed or altered, and the foundations are provided with additional insulation to prevent thawing of the underlying ground. { 'pas·iv 'meth·əd }

passive radar [ENG] A technique for detecting objects at a distance by picking up the microwave electromagnetic energy that is both radiated and reflected by all bodies. { 'pas·iv 'rāˌdär }

passive radiator [ENG ACOUS] A loudspeaker driver with no voice-coil or magnet assemblies that is mounted in a box with a woofer and exhibits a resonance that can be used to improve the low-frequency response of the system. { ˌpas·iv 'rād·ēˌād·ər }

passive solar system [MECH ENG] A solar heating or cooling system that operates by using gravity, heat flows, or evaporation rather than mechanical devices to collect and transfer energy. { 'pas·iv 'sō·lər ˌsis·təm }

passive sonar [ENG] Sonar that uses only underwater listening equipment, with no transmission of location-revealing pulses. { 'pas·iv 'sōˌnär }

passive transducer [ELECTR] A transducer containing no internal source of power. { 'pas·iv tranz'dü·sər }

paste mixer [ENG] Device for the blending together of solid particles and a liquid, with the final formation of a single paste phase. { 'pāst ˌmik·sər }

paste-up *See* mechanical. { 'pāstˌəp }

pasteurizer [ENG] An apparatus used for pasteurization of fluids. { 'pas·chəˌrīz·ər }

patch [ELEC] A temporary connection between jacks or other terminations on a patch board. { pach }

patch bolt [DES ENG] A bolt with a countersunk head having a square knob that twists off when the bolt is screwed in tightly; used to repair boilers and steel ship hulls. { 'pach ˌbōlt }

patent [IND ENG] A certificate of grant by a government of an exclusive right with respect to

an invention for a limited period of time. Also known as letters patent. { 'pat·ənt }

path computation [CONT SYS] The calculations involved in specifying the trajectory followed by a robot. { 'path ˌkäm·pyəˌtā·shən }

pattern [ENG] A form designed and used as a model for making things. { 'pad·ərn }

pattern shooting [ENG] In seismic prospecting, firing of explosive charges arranged in geometric pattern. { 'pad·ərn ˌshüd·iŋ }

pavement [BUILD] A hard floor of concrete, brick, tiles, or other material. [CIV ENG] A paved surface. { 'pāv·mənt }

pavement light [CIV ENG] A window built into the surface of a pavement to admit daylight to a space below ground level. { 'pāv·mənt ˌlīt }

paver [MECH ENG] Any of several machines which, moving along the road, carry and lay paving material. { 'pāv·ər }

pawl [MECH ENG] The driving link or holding link of a ratchet mechanism, permits motion in one direction only. { pȯl }

payback period [IND ENG] The amount of time required for achieving an amount in profits to offset the cost of a capital expenditure, such as the cost of investment in modifications in an industrial facility for the purpose of conserving energy. { 'pāˌbak ˌpir·ē·əd }

payout time [IND ENG] A measurement of profitability or liquidity of an investment, being the time required to recover the original investment in depreciable facilities from profit and depreciation; usually, but not always, calculated after income taxes. { 'pāˌaůt ˌtīm }

p-channel metal-oxide semiconductor *See* PMOS. { ¦pē ˌchan·əl ˌmed·əl ¦äkˌsīd 'sem·i·kənˌdək·tər }

p chart [IND ENG] A chart of the fraction defective, either observed in the sample or in some production period. { 'pē ˌchärt }

pdl-ft *See* foot-poundal.

PDM *See* precedence diagram method.

PDR *See* precision depth recorder.

peak load [ELEC] The maximum instantaneous load or the maximum average load over a designated interval of time. Also known as peak power. [ENG] The maximum quantity of a specified material to be carried by a conveyor per minute in a specified period of time. { 'pēk ˌlōd }

peak power *See* peak load. { 'pēk 'paů·ər }

Peaucellier linkage [MECH ENG] A mechanical linkage to convert circular motion exactly into straight-line motion. { pō'sel·yā ˌliŋ·kij }

pebble heater [CHEM ENG] Gas-heating device (for air, hydrogen, methane, and steam) in which heat is transferred to the gas via a countercurrent movement of preheated pebbles. { 'peb·əl ˌhēd·ər }

pebble mill [MECH ENG] A solids size-reduction device with a cylindrical or conical shell rotating on a horizontal axis, and with a grinding medium such as balls of flint, steel, or porcelain. { 'peb·əl ˌmil }

peck [MECH] Abbreviated pk. **1.** A unit of volume used in the United States for measurement of solid substances, equal to 8 dry quarts, or 1/4 bushel, or 537.605 cubic inches, or 0.00880976754172 cubic meter. **2.** A unit of volume used in the United Kingdom for measurement of solid and liquid substances, although usually the former, equal to 2 gallons, or 0.00909218 cubic meter. { pek }

Peclet number [CHEM ENG] Dimensionless group used to determine the chemical reaction similitude for the scale-up from pilot-plant data to commercial-sized units; incorporates heat capacity, density, fluid velocity, and other pertinent physical parameters. { pə'klā ˌnəm·bər }

pedal [DES ENG] A lever operated by foot. { 'ped·əl }

pedestal [CIV ENG] **1.** The support for a column. **2.** A metal support carrying one end of a bridge truss or girder and transmitting any load to the top of a pier or abutment. [ELECTR] *See* blanking level. [ENG] A supporting part or the base of an upright structure, such as a radar antenna. { 'ped·əst·əl }

pedestal design [MECH ENG] A robot design centered on the vertical axis of a central pedestal, in which the motion of any workpiece is confined to a spherical working envelope. { 'ped·əst·əl diˌzīn }

pedestal flooring *See* raised flooring. { 'ped·ə·stəl ˌflȯr·iŋ }

pedestal pile [CIV ENG] A concrete pile with a bulbous enlargement at the bottom. { 'ped·əst·əl ˌpīl }

pedometer [ENG] **1.** An instrument for measuring and weighing a newborn child. **2.** An instrument that registers the number of footsteps and distance covered in walking. { pə'däm·əd·ər }

peel-back [ENG] The separation of two bonded materials, one or both of which are flexible, by stripping or pulling the flexible material from the mating surface at a 90 or 180° angle to the plane in which it is adhered. { 'pēl ˌbak }

peel-off time [ENG] In seismic prospecting, the time correction applied to observed data to adjust them to a depressed reference datum. { 'pēl ˌȯf ˌtīm }

peel test [ENG] A test to ascertain the adhesive strength of bonded strips of metals by peeling or pulling the metal strips back and recording the adherence values. { 'pēl ˌtest }

peen [DES ENG] The end of a hammer head with a hemispherical, wedge, or other shape; used to bend, indent, or cut. { pēn }

peepdoor [MECH ENG] A small door in a furnace with a glass opening through which combustion may be observed. { 'pēpˌdȯr }

peg [ENG] **1.** A small pointed or tapered piece, often cylindrical, used to pin down or fasten parts. **2.** A projection used to hang or support objects. { peg }

peg count meter [ENG] A meter or register that counts the number of trunks tested, the number of circuits passed busy, the number of test failures, or the number of repeat tests completed. { 'peg ˌkaůnt ˌmēd·ər }

PEL *See* permissible exposure limit. { pel }

pellet cooler [CHEM ENG] Gas-cooled, gravity-bed device for the cooling and drying of extruded pellets and briquets. { 'pel·ət ˌkül·ər }

pelleting [ENG] Method of accelerating solidification of cast explosive charges by blending precast pellets of the explosives into the molten charge. { 'pel·əd·iŋ }

pelletizer [CHEM ENG] A machine for cutting bulk plastic into pellets, suitable for use as feedstock, either from solidified polymer at the end of the manufacturing process or from the molten polymer as it emerges from the die. { 'pel·əˌtīz·ər }

pellet mill [MECH ENG] Device for injecting particulate, granular or pasty feed into holes of a roller, then compacting the feed into a continuous solid rod to be cut off by a knife at the periphery of the roller. { ˌpel·ət ˌmil }

Pelton turbine *See* Pelton wheel. { 'pel·tən 'tər·bən }

Pelton wheel [MECH ENG] An impulse hydraulic turbine in which pressure of the water supply is converted into velocity by a few stationary nozzles, and the water jets then impinge on the buckets mounted on the rim of a wheel; usually limited to high head installations, exceeding 500 feet (150 meters). Also known as Pelton turbine. { 'pel·tən ˌwēl }

pen [ENG] **1.** A small place for confinement, storage, or protection. **2.** A device for writing with ink. { pen }

pencil [ENG] An implement for writing or making marks with a solid substance; the three basic kinds are graphite, carbon, and colored. { 'pen·səl }

pencil cave [ENG] A driller's term for hard, closely jointed shale that caves into a well in pencil-shaped fragments. { 'pen·səl ˌkāv }

pendant atomizer *See* hanging-drop atomizer. { 'pen·dənt 'ad·əˌmiz·ər }

pendant post [BUILD] A post on a solid support and set against a wall to support a collar beam or other part of a roof. { 'pen·dənt ˌpōst }

pendulous gyroscope [MECH] A gyroscope whose axis of rotation is constrained by a suitable weight to remain horizontal; it is the basis of one type of gyrocompass. { 'pen·jə·ləs 'jī·rəˌskōp }

pendulum anemometer [ENG] A pressure-plate anemometer consisting of a plate which is free to swing about a horizontal axis in its own plane above its center of gravity; the angular deflection of the plate is a function of the wind speed; this instrument is not used for station measurements because of the false reading which results when the frequency of the wind gusts and the natural frequency of the swinging plate coincide. { 'pen·jə·ləm ˌan·ə'mäm·əd·ər }

pendulum level [ENG] A leveling instrument in which the line of sight is automatically kept horizontal by a built-in pendulum device (such as a horizontal arm and a plumb line at right angles to the arm). { 'pen·jə·ləm ˌlev·əl }

pendulum press [MECH ENG] A punch press actuated by a swinging treadle operated by the foot. { 'pen·jə·ləm ˌpres }

pendulum saw [MECH ENG] A circular saw that swings in a vertical arc for crosscuts. { 'pen·jə·ləm ˌsȯ }

pendulum scale [ENG] Weight-measurement device in which the load is balanced by the movement of one or more pendulums from vertical (zero weight) to horizontal (maximum weight). { 'pen·jə·ləm ˌskāl }

pendulum seismograph [ENG] A seismograph that measures the relative motion between the ground and a loosely coupled inertial mass; in some instruments, optical magnification is used whereas others exploit electromagnetic transducers, photocells, galvanometers, and electronic amplifiers to achieve higher magnification. { 'pen·jə·ləm 'sīz·məˌgraf }

penetration ballistics [MECH] A branch of terminal ballistics concerned with the motion and behavior of a missile during and after penetrating a target. { ˌpen·ə'trā·shən bəˌlis·tiks }

penetration depth [ELEC] In induction heating, the thickness of a layer, extending inward from a conductor's surface, whose resistance to direct current equals the resistance of the whole conductor to alternating current of a given frequency. [ENG] The greatest depth in an ultrasonic test piece at which indications can be measured. { ˌpen·ə'trā·shən ˌdepth }

penetration number [ENG] The consistency of greases, waxes, petrolatum, and asphalt or other bituminous materials expressed as the distance that a standard needle penetrates the sample under specified American Society for Testing and Materials test conditions. { ˌpen·ə'trā·shən ˌnəm·bər }

penetration rate [MECH ENG] The actual rate of penetration of drilling tools. { ˌpen·ə'trā·shən ˌrāt }

penetration speed [MECH ENG] The speed at which a drill can cut through rock or other material. { ˌpen·ə'trā·shən ˌspēd }

penetration test [ENG] A test to determine the relative values of density of noncohesive sand or silt at the bottom of boreholes. { ˌpen·ə'trā·shən ˌtest }

penetrometer [ENG] **1.** An instrument that measures the penetrating power of a beam of x-rays or other penetrating radiation. **2.** An instrument used to determine the consistency of a material by measurement of the depth to which a standard needle penetrates into it under standard conditions. { ˌpen·ə'träm·əd·ər }

Penex process [CHEM ENG] A continuous, nonregenerative petroleum-refinery process for isomerization of C_5 or C_6 fractions in the presence of hydrogen and a platinum catalyst. { 'peˌneks ˌprä·səs }

Penning trap [ENG] A device for trapping electrons and isolating single electrons, consisting of a large, homogeneous magnetic field plus a superimposed weak parabolic electric potential

created by a positive charge +Q on a ring electrode and two negative charges −Q/2 each on two cap electrodes. { 'pen·iŋ ˌtrap }

Penning-trap mass spectrometer [ENG] A device for making highly accurate comparisons of the masses of charged atoms and molecules by comparing the cyclotron frequencies of single ions in a Penning trap. { ¦pen·iŋˌtrap ˌmas spek 'träm·əd·ər }

Pennsylvania truss [CIV ENG] A truss characterized by subdivided panels, curved top chords on through trusses, and curved bottom chords on deck spans; used on long bridge spans. { ¦pen·səl¦vā·nyə 'trəs }

pennyweight [MECH] A unit of mass equal to 1/20 troy ounce or to 1.55517384 grams; the term is employed in the United States and in England for the valuation of silver, gold, and jewels. Abbreviated dwt; pwt. { 'pen·ēˌwāt }

pen recorder [ENG] A device in which the varying inputs (electrical, pneumatic, mechanical) are marked by a signal-controlled pen onto a continuous recorder chart (circular or roll chart). { 'pen riˌkȯrd·ər }

Pensky-Martens closed tester [CHEM ENG] Device to determine the American Society for Testing and Materials flash point of fuel oils and cutback asphalts and other viscous materials and suspensions of solids. { 'pen·skē 'märt·ənz 'klōsd 'tes·tər }

penstock [CIV ENG] A valve or sluice gate for regulating water or sewage flow. [ENG] A closed water conduit controlled by valves and located between the intake and the turbine in a hydroelectric plant. { 'penˌstäk }

pentane lamp [ENG] A pentane-burning lamp formerly used as a standard for photometry. { 'penˌtān ˌlamp }

penthouse [BUILD] **1.** An enclosed space built on a flat roof to cover a stairway, elevator, or other equipment. **2.** A dwelling built on top of the main roof. **3.** A sloping shed or roof attached to a wall or building. { 'pentˌhaůs }

percentage log [ENG] A sample log in which the percentage of each type of rock (except obvious cavings) present in each sample of cuttings is estimated and plotted. { pər'sen·tij ˌläg }

percent compaction [ENG] The ratio, expressed as a percentage, of dry unit weight of a soil to maximum unit weight obtained in a laboratory compaction test. { pər'sent kəm'pak·shən }

percent defective [IND ENG] The ratio of defective pieces per lot or sample, expressed as a percentage. { pər'sent di'fek·div }

perch [MECH] Also known as pole; rod. **1.** A unit of length, equal to 5.5 yards, or 16.5 feet, or 5.0292 meters. **2.** A unit of area, equal to 30.25 square yards, or 272.25 square feet, or 25.29285264 square meters. { pərch }

percolation filtration [CHEM ENG] A continuous petroleum-refinery process in which lubricating oils and waxes are percolated through a clay bed to improve color, odor, and stability. { pər·kə'lā·shən filˌtrā·shən }

percolation test [CIV ENG] A test to determine the suitability of a soil for the installation of a domestic sewage-disposal system, in which a hole is dug and filled with water and the rate of water-level decline is measured. { pər·kə'lā·shən ˌtest }

percussion bit [MECH ENG] A rock-drilling tool with chisellike cutting edges, which when driven by impacts against a rock surface drills a hole by a chipping action. { pər'kəsh·ən ˌbit }

percussion drill [MECH ENG] A drilling machine usually using compressed air to drive a piston that delivers a series of impacts to the shank end of a drill rod or steel and attached bit. { pər'kəsh·ən ˌdril }

percussion drilling [MECH ENG] A drilling method in which hammer blows are transmitted by the drill rods to the drill bit. { pər'kəsh·ən ˌdril·iŋ }

perfect dielectric *See* ideal dielectric. { 'pər·fikt ˌdī·ə'lek·trik }

perfect gas *See* ideal gas. { 'pər·fikt 'gas }

perfect lubrication [ENG] A complete, unbroken film of liquid formed over each of two metal surfaces moving relatively to one another with no contact. { 'pər·fikt ˌlü·brə'kā·shən }

perforated-pipe distributor [CHEM ENG] Liquid distribution device consisting of a length of piping or tubing with holes at spaced intervals along the length; used in spray columns, liquid-vapor contactors, and spray driers. Also known as a sparger. { 'pər·fəˌrād·əd ¦pīp di'strib·yəd·ər }

perforated plate [CHEM ENG] Flat plate with series of holes used to control fluid distribution, as in a perforated-plate (distillation) column. { 'pər·fəˌrād·əd 'plāt }

perforated-plate column [CHEM ENG] Distillation column in which vapor-liquid contact is provided by perforated plates instead of bubble-cap trays. { 'pər·fəˌrād·əd ¦plāt 'käl·əm }

perforated-plate distributor [CHEM ENG] **1.** A perforated plate or screen used to even out liquid-flow fluctuations through flow channels. **2.** A perforated plate as used in a distillation column or liquid-liquid extraction column. { 'pər·fəˌrād·əd ¦plāt di'strib·yəd·ər }

perforated-plate extractor [CHEM ENG] A liquid-liquid extraction vessel in which perforated plates are used to bring about contact between the two or more liquid phases. { 'pər·fəˌrād·əd ¦plāt ik'strak·tər }

performance bond [ENG] A bond that guarantees performance of a contract. { pər'fȯr·məns ˌbänd }

performance characteristic [ENG] A characteristic of a piece of equipment, determined during its test or during its operation. { pər'fȯr·məns ˌkar·ik·tə'ris·tik }

performance chart [ENG] A graph used in evaluating the performance of any device, for example, the performance of an electrical or electronic device, such as a graph of anode voltage versus anode current for a magnetron. { pər'fȯr·məns ˌchärt }

performance curves [ENG] Graphical representations showing the abilities of rotating equipment at various operating conditions; for example, the performance curve for a compressor would include rotor speed for various intake and outlet pressures versus gas flow rate adjusted for temperature, density, viscosity, head, and other factors. { pər'fȯr·məns ˌkərvz }

performance data [ENG] Data on the manner in which a given substance or piece of equipment performs during actual use. { pər'fȯr·məns ˌdad·ə }

performance evaluation [IND ENG] The analysis in terms of initial objectives and estimates, and usually made on site, of accomplishments using an automatic data-processing system, to provide information on operating experience and to identify corrective actions required, if any. { pər'fȯr·məns iˌval·yə'wā·shən }

performance index [IND ENG] The ratio of standard hours to the hours of work actually used; a ratio exceeding 1.00 (or 100) indicates standard output is being exceeded. { pər'fȯr·məns ˌinˌdeks }

performance measurement baseline [IND ENG] A time-phased budget plan developed for use in measuring contract performance; includes the budgets assigned to scheduled work elements and the related indirect budgets. { pərˈfȯrm·əns ˈmezh·ər·mənt 'bāsˌlīn }

performance number [ENG] One of a series of numbers (constituting the PN, or performance-number, scale) used to convert fuel antiknock values in terms of a reference fuel into an index which is an indication of relative engine performance; used mostly to rate aviation gasolines with octane values greater than 100. { pər'fȯr·məns ˌnəm·bər }

performance rating *See* effort rating. { pər'fȯr·məns ˌrād·iŋ }

performance sampling [IND ENG] A technique in work measurement used to determine the leveling factor to be applied to an operator or a group of operators by short, randomly spaced observations of the performance index. { pər'fȯr·məns ˌsam·pliŋ }

peridynamic loudspeaker [ENG ACOUS] Box-type loudspeaker baffle designed to give good bass response by minimizing acoustic standing. { ˌper·ə·dəˈnam·ik 'laudˌspēk·ər }

periodic kiln [ENG] A kiln in which the cycle of setting ware in the kiln, heating up, "soaking" or holding at peak temperature for some time, cooling, and removing or "drawing" the ware is repeated for each batch. { ˌpir·ēˌäd·ik 'kil }

periodic motion [MECH] Any motion that repeats itself identically at regular intervals. { ˌpir·ēˌäd·ik 'mō·shən }

peripheral speed *See* cutting speed. { pə'rif·ə·rəl ˌspēd }

peristaltic pump [MECH ENG] A device for moving fluids by the action of multiple, equally spaced rollers, which rotate and compress a flexible tube. { ˌper·əˌstal·tik 'pəmp }

permafrost drilling [ENG] Boreholes drilled in subsoil and rocks in which the contained water is permanently frozen. { 'pər·məˌfrȯst 'dril·iŋ }

permanent axis [MECH] The axis of the greatest moment of inertia of a rigid body, about which it can rotate in equilibrium. { 'pər·mə·nənt 'ak·səs }

permanent benchmark [ENG] A readily identifiable, relatively permanent, recoverable benchmark that is intended to maintain its elevation without change over a long period of time with reference to an adopted datum, and is located where disturbing influences are believed to be negligible. { 'pər·mə·nənt 'benchˌmärk }

permanent gas [THERMO] A gas at a pressure and temperature far from its liquid state. { 'pər·mə·nənt 'gas }

permanent-magnet dynamic loudspeaker *See* permanent-magnet loudspeaker. { 'pər·mə·nənt ˌmag·nət dīˌnam·ik 'laudˌspēk·ər }

permanent-magnet loudspeaker [ENG ACOUS] A moving-conductor loudspeaker in which the steady magnetic field is produced by a permanent magnet. Also known as permanent-magnet dynamic loudspeaker. { 'pər·mə·nənt ˌmag·nət 'laudˌspēk·ər }

permanent-magnet moving-coil instrument [ENG] An ammeter or other electrical instrument in which a small coil of wire, supported on jeweled bearings between the poles of a permanent magnet, rotates when current is carried to it through spiral springs which also exert a restoring torque on the coil; the position of the coil is indicated by an attached pointer. { 'pər·mə·nənt ˌmag·nət ˌmüv·iŋ ˌkōil 'in·strə·mənt }

permanent-magnet moving-iron instrument [ENG] A meter that depends for its operation on a movable iron vane that aligns itself in the resultant magnetic field of a permanent magnet and adjacent current-carrying coil. { 'pər·mə·nənt ˌmag·nət ˌmüv·iŋ ˌī·ərn 'in·strə·mənt }

permanent set [MECH] Permanent plastic deformation of a structure or a test piece after removal of the applied load. Also known as set. { 'pər·mə·nənt 'set }

permanent stop [IND ENG] In a flexible manufacturing system a type of controlled stop where an automated guided vehicle will always halt, regardless of programming. { 'pər·mə·nənt 'stäp }

permeability number [ENG] A numbered value assigned to molding materials indicating the relative ease of passage of gases through them. { ˌpər·mē·əˈbil·əd·ē ˌnəm·bər }

permeameter [ENG] **1.** A laboratory device for measurement of permeability of materials, for example, soil or rocks; consists of a powder bed of known dimension and degree of packing through which the particles are forced; pressure drop and rate of flow are related to particle size, and pressure drop is related to surface area. **2.** A device for measuring the coefficient of permeability by measuring the flow of fluid through a sample across which there is a pressure drop produced by gravity. **3.** An instrument for measuring the magnetic flux or flux density produced

in a test specimen of ferromagnetic material by a given magnetic intensity, to permit computation of the magnetic permeability of the material. { ˌpər·mē'äm·əd·ər }

permeate [CHEM ENG] The clear fluid that passes through the membrane in a membrane filtration process. { 'pər·mēˌāt }

permeator [CHEM ENG] A membrane assembly that performs an ion-exchange function, for example, desalting in a membrane water-desalting process. { 'pər·mēˌād·ər }

permissible exposure limit [IND ENG] The level of air contaminants that represents an acceptable exposure level as specified in standards set by a national government agency; generally expressed as 8-hour time-weighted average concentrations. Abbreviated PEL. { pərˈmis·ə·bəl ik'spō·zhər ˌlim·ət }

permissible velocity [CIV ENG] The highest velocity at which water is permitted to pass through a structure or conduit without excessive damage. { pər'mis·ə·bəl vəˈläs·əd·ē }

permissive block system [CIV ENG] A block system in which a railroad train is permitted to enter a block section already occupied by a train. { pərˈmis·iv 'bläk ˌsis·təm }

permissive stop [CIV ENG] A railway signal indicating the train must stop but can proceed slowly and cautiously after a specified interval, usually 1 minute. { pər'mis·iv 'stäp }

permittivity [ELEC] The dielectric constant multiplied by the permittivity of empty space, where the permittivity of empty space (ϵ_0) is a constant appearing in Coulomb's law, having the value of 1 in centimeter-gram-second electrostatic units, and of 8.854×10^{-12} farad/meter in rationalized meter-kilogram-second units. Symbolized ϵ. { ˌpər·məˈtiv·əd·ē }

pernetti [ENG] **1.** Small iron pins or tripods that support ware while it is being fired in a kiln. **2.** The marks left on baked pottery by these supporting pins. { pər'ned·ē }

perpend [CIV ENG] A bondstone that extends completely through a masonry wall and is exposed on each side of the wall. { 'pərˌpend }

perpendicular axis theorem [MECH] A theorem which states that the sum of the moments of inertia of a plane lamina about any two perpendicular axes in the plane of the lamina is equal to the moment of inertia about an axis through their intersection perpendicular to the lamina. { ˌpər·pənˈdik·yə·lər 'ak·səs ˌthir·əm }

Pers sunshine recorder [ENG] A type of sunshine recorder in which the time scale is supplied by the motion of the sun. { 'pərs 'sənˌshīn riˌkȯrd·ər }

PERT [SYS ENG] A management control tool for defining, integrating, and interrelating what must be done to accomplish a desired objective on time; a computer is used to compare current progress against planned objectives and give management the information needed for planning and decision making. Derived from program evaluation and review technique. { pərt }

peter out [ENG] To fail gradually in size, quantity, or quality; for example, a mine may be said to have petered out. { 'pēd·ər ˈaůt }

Petersen grab [ENG] A bottom sampler consisting of two hinged semicylindrical buckets held apart by a cocking device which is released when the grab hits the ocean floor. { 'pēd·ər·sən ˌgrab }

petroleum engineering [ENG] The application of almost all types of engineering to the drilling for and production of oil, gas, and liquefiable hydrocarbons. { pəˈtrō·lē·əm ˌen·jəˈnir·iŋ }

petroleum isomerization process [CHEM ENG] A fixed-bed, vapor-phase petroleum-refinery process using a precious-metal catalyst and external hydrogen; feedstocks include natural gas, pentane, and hexane cuts; the product is high-octane blending stock. { pəˈtrō·lē·əm ˌīsəmˈə·rəˈzā·shən ˌprä·səs }

petroleum processing [CHEM ENG] The recovery and processing of various usable fractions from the complex crude oils; usable fractions include gasoline, kerosine, diesel oil, fuel oil, and asphalt. Also known as petroleum refining. { pəˈtrō·lē·əm 'präˌses·iŋ }

petroleum refining *See* petroleum processing. { pəˈtrō·lē·əm riˌfīn·iŋ }

Petterson-Nansen water bottle *See* Nansen bottle. { 'ped·ər·sən 'nan·sən 'wȯd·ər ˌbäd·əl }

Pettit truss [CIV ENG] A bridge truss in which the panel is subdivided by a short diagonal and a short vertical member, both intersecting the main diagonal at its midpoint. { 'ped·ət ˌtrəs }

PGR *See* precision depth recorder.

pharmaceutical chemistry [CHEM ENG] The chemistry of drugs and of medicinal and pharmaceutical products. { ˌfär·məˈsüd·ə·kəl 'kem·ə·strē }

phase [THERMO] The type of state of a system, such as solid, liquid, or gas. { fāz }

phase advancer [ELEC] Phase modifier which supplies leading reactive volt-amperes to the system to which it is connected; may be either synchronous or asynchronous. { 'fāz idˌvan·sər }

phase-angle meter *See* phase meter. { 'fāz ˈaŋ·gəl ˌmēd·ər }

phase-balance relay [ELEC] Relay which functions by reason of a difference between two quantities associated with different phases of a polyphase circuit. { 'fāz ˈbal·əns 'rēˌlā }

phase-change material [ENG] A material which is used to store the latent heat absorbed in the material during a phase transition. { 'fāz ˌchānj məˌtir·ē·əl }

phase-comparison relaying [ELEC] A method of detecting faults in an electric power system in which signals are transmitted from each of two terminals every half cycle so that a continuous signal is received at an intermediate point if there is no fault between the terminals, while a periodic signal is received if there is a fault. { 'fāz kəmˌpar·ə·sən 'rēˌlā·iŋ }

phase conductor [ELEC] In a polyphase circuit,

any conductor other than the neutral conductor. { 'fāz kən,dək·tər }

phase converter [ELEC] A converter that changes the number of phases in an alternating-current power source without changing the frequency. { 'fāz kən,vərd·ər }

phase crossover [CONT SYS] A point on the plot of the loop ratio at which it has a phase angle of 180°. { 'fāz 'krós,ō·vər }

phase diagram [THERMO] **1.** A graph showing the pressures at which phase transitions between different states of a pure compound occur, as a function of temperature. **2.** A graph showing the temperatures at which transitions between different phases of a binary system occur, as a function of the relative concentrations of its components. { 'fāz ,dī·ə,gram }

phase factor *See* power factor. { 'fāz ,fak·tər }

phase integral *See* action. { 'fāz ¦int·ə·grəl }

phase-locked system [ENG] A radar system, having a stable local oscillator, in which information regarding the target is gained by measuring the phase shift of the echo. { 'fāz ¦läkt ,sis·təm }

phase margin [CONT SYS] The difference between 180° and the phase of the loop ratio of a stable system at the gain-crossover frequency. { 'fāz ,mär·jən }

phase meter [ENG] An instrument for the measurement of electrical phase angles. Also known as phase-angle meter. { 'fāz ,mēd·ər }

phase modifier [ELEC] Machine whose chief purpose is to supply leading or lagging reactive volt-amperes to the system to which it is connected; may be either synchronous or asynchronous. { 'fāz ,mäd·ə,fī·ər }

phase plane analysis [CONT SYS] A method of analyzing systems in which one plots the time derivative of the system's position (or some other quantity characterizing the system) as a function of position for various values of initial conditions. { 'fāz ¦plān ə'nal·ə·səs }

phase portrait [CONT SYS] A graph showing the time derivative of a system's position (or some other quantity characterizing the system) as a function of position for various values of initial conditions. { 'fāz ,pór·trət }

phase-rotation relay *See* phase-sequence relay. { 'fāz rō¦tā·shən 'rē,lā }

phase-sequence relay [ELEC] Relay which functions according to the order in which the phase voltages successively reach their maximum positive values. Also known as phase-rotation relay. { 'fāz ¦sē·kwəns 'rē,lā }

phase shift [ELECTR] The phase angle between the input and output signals of a network or system. { 'fāz ,shift }

phase-shift circuit [ELECTR] A network that provides a voltage component which is shifted in phase with respect to a reference voltage. { 'fāz ¦shift ,sər·kət }

phase shifter [ELEC] A device used to change the phase relation between two alternating-current values. { 'fāz ,shif·tər }

phase-shifting transformer [ELEC] A transformer which produces a difference in phase angle between two circuits. { 'fāz ¦shif·tiŋ tranz ,fór·mər }

phase splitter [ELEC] A circuit that takes a single input alternating voltage and produces two or more output alternating voltages that differ in phase from one another. { 'fāz ,splid·ər }

phase transformation [ELEC] A change of polyphase power from three-phase to six-phase, from three-phase to twelve-phase, and so forth, by use of transformers. { 'fāz ,tranz·fər,mā·shən }

phase transformer [ELEC] A transformer for changing a two-phase current to a three-phase current, or vice versa. { 'fāz tranz,fór·mər }

phase undervoltage relay [ELEC] Relay which functions by reason of the reduction of one phase voltage in a polyphase circuit. { 'fāz 'ən·dər,vōl·tij 'rē,lā }

phasing *See* framing. { 'fāz·iŋ }

phenolate process [CHEM ENG] A process which employs sodium phenolate to remove hydrogen sulfide from gas. { 'fēn·ə,lāt ,prä·səs }

phenol extraction [CHEM ENG] Petroleum-refinery solvent-extraction process using phenol as the solvent to remove aromatic, unsaturated and naphthenic constituents from lubricating-oil stocks. { 'fē,nòl ik,strak·shən }

phenol process [CHEM ENG] A single-solvent petroleum-refining process in which phenol is the selective solvent. { 'fē,nòl ,prä·səs }

Philips hot-air engine [MECH ENG] A compact hot-air engine that is a Philips Research Lab (Holland) design; it uses only one cylinder and piston, and operates at 3000 revolutions per minute, with hot-chamber temperature of 1200°F (650°C), maximum pressure of 50 atmospheres (5.07 megapascals), and mean effective pressure of 14 atmospheres (1.42 megapascals). { 'fil·əps 'hät ¦er ,en·jən }

Phillips screw [DES ENG] A screw having in its head a recess in the shape of a cross; it is inserted or removed with a Phillips screwdriver that automatically centers itself in the screw. { 'fil·əps ,skrü }

phleger corer [ENG] A device for obtaining ocean bottom cores up to about 4 feet (1.2 meters) in length; consists of an upper tube, main body weight, and tailfin assembly with a check valve that prevents the flow of water into the upper section and a consequent washing out of the core sample while hoisting the corer. { 'flej·ər ,kór·ər }

pH meter [ENG] An electronic voltmeter using a pH-responsive electrode that gives a direct conversion of voltage differences to differences of pH at the temperature of the measurement. { ,pē'āch ,mēd·ər }

phonation [ENG ACOUS] Production of speech sounds. { fō'nā·shən }

phone *See* headphone. { fōn }

phonemic synthesizer [ENG ACOUS] A voice response system in which each word is abstractly represented as a sequence of expected vowels and consonants, and speech is composed by juxtaposing the expected phonemic sequence

for each word with the sequences for the preceding and following words. { fə'nē·mik 'sin·thə,sīz·ər }

phonograph [ENG ACOUS] An instrument for recording or reproducing acoustical signals, such as voice or music, by transmission of vibrations from or to a stylus that is in contact with a groove in a rotating disk. { 'fō·nə,graf }

phonograph cartridge *See* phonograph pickup. { 'fō·nə,graf ,kär·trij }

phonograph cutter *See* cutter. { 'fō·nə,graf ,kəd·ər }

phonograph needle *See* stylus. { 'fō·nə,graf ,nēd·əl }

phonograph pickup [ENG ACOUS] A pickup that converts variations in the grooves of a phonograph record into corresponding electric signals. Also known as cartridge; phonograph cartridge. { 'fō·nə,graf ,pik,əp }

phonograph record [ENG ACOUS] A shellac-composition or vinyl-plastic disk, usually 7 or 12 inches (18 or 30 centimeters) in diameter, on which sounds have been recorded as modulations in grooves. Also known as disk; disk recording. { 'fō·nə,graf ,rek·ərd }

phonon friction [MECH] Friction that arises when atoms close to a surface are set into motion by the sliding action of atoms in an opposing surface, and the mechanical energy needed to slide one surface over the other is thereby converted to the energy of atomic lattice vibrations (phonons) and is eventually transformed into heat. { 'fō,nän ,frik·shən }

phonotelemeter [ENG] A device consisting essentially of a stopwatch, for estimating the distance of guns in action by measuring the interval between the flash and the arrival of the sound waves from the discharge. { ¦fō·nō·tə'lem·əd·ər }

phosphate desulfurization [CHEM ENG] A continuous, regenerative petroleum-refinery process using a tripotassium phosphate solution to remove hydrogen sulfide from natural gas, refinery gas, or liquid hydrocarbons. { 'fā,sfāt dē,səl·fə·rə'zā·shən }

phosphoric acid polymerization [CHEM ENG] A petroleum-refinery process using phosphoric acid catalyst to convert propylene, butylene, or both, into high-octane gasoline or petrochemical polymers. { fā'sfȯr·ik 'as·əd pə,lim·ə·rə'zā·shən }

photoalidade [ENG] A photogrammetric instrument which has a telescopic alidade, a plateholder, and a hinged ruling arm and is mounted on a tripod frame; used for plotting lines of direction and measuring vertical angles to selected features appearing on oblique and terrestrial photographs. { ¦fōd·ō'al·ə,dād }

photocapacitative effect [ELEC] A change in the capacitance of a bulk semiconductor or semiconductor surface film upon exposure to light. { ,fōd·ō·kə'pas·ə,tā·tiv i,fekt }

photoclinometer [ENG] A directional surveying instrument which records photographically the direction and magnitude of well deviations from the vertical. { ¦fōd·ō·klə'näm·əd·ər }

photoconductive device [ELECTR] A photoelectric device which utilizes the photoinduced change in electrical conductivity to provide an electrical signal. { fōd·ō·kən'dək·tiv di'vīs }

photoconductive film [ELECTR] A film of material whose current-carrying ability is enhanced when illuminated. { fōd·ō·kən'dək·tiv 'film }

photoconductor diode *See* photodiode. { fōd·ō·kən'dək·tər 'dī,ōd }

photodetector [ELECTR] A detector that responds to radiant energy; examples include photoconductive cells, photodiodes, photoresistors, photoswitches, phototransistors, phototubes, and photovoltaic cells. Also known as light-sensitive cell; light-sensitive detector; light sensor photodevice; photodevice; photoelectric detector; photosensor. { ¦fōd·ō·di'tek·tər }

photodiffusion effect *See* Dember effect. { ¦fōd·ō·di'fyü·zhən i,fekt }

photodiode [ELECTR] A semiconductor diode in which the reverse current varies with illumination; examples include the alloy-junction photocell and the grown-junction photocell. Also known as photoconductor diode. { ¦fōd·ō'dī,ōd }

photodraft [DES ENG] A photographic reproduction of a master layout or design on a specially prepared emulsion-coated piece of sheet metal; used as a master in a tool-construction department. { 'fōd·ō,draft }

photoecology [ENG] The application of air photography to ecology, integrated land resource studies, and forestry. { ¦fōd·ō·i'käl·ə·jē }

photoelectric [ELECTR] Pertaining to the electrical effects of light, such as the emission of electrons, generation of voltage, or a change in resistance when exposed to light. { ¦fōd·ō·i 'lek·trik }

photoelectric absorption [ELECTR] Absorption of photons in one of the several photoelectric effects. { ¦fōd·ō·i'lek·trik əb'sȯrp·shən }

photoelectric cell *See* photocell. { ¦fōd·ō·i'lek·trik 'sel }

photoelectric colorimeter [ENG] A colorimeter that uses a phototube or photocell, a set of color filters, an amplifier, and an indicating meter for quantitative determination of color. { ¦fōd·ō·i'lek·trik ,kəl·ə'rim·əd·ər }

photoelectric constant [ELECTR] The ratio of the frequency of radiation causing emission of photoelectrons to the voltage corresponding to the energy absorbed by a photoelectron; equal to Planck's constant divided by the electron charge. { ¦fōd·ō·i'lek·trik 'kän·stənt }

photoelectric control [ELECTR] Control of a circuit or piece of equipment by changes in incident light. { ¦fōd·ō·i'lek·trik kən'trōl }

photoelectric densitometer [ENG] An electronic instrument used to measure the density or opacity of a film or other material; a beam of light is directed through the material, and the amount of light transmitted is measured with

a photocell and meter. { ¦fōd·ō·i'lek·trik ˌden·sə'täm·əd·ər }

photoelectric detector *See* photodetector. { ¦fōd·ō·i'lek·trik di'tek·tər }

photoelectric device [ELECTR] A device which gives an electrical signal in response to visible, infrared, or ultraviolet radiation. { ¦fōd·ō·i'lek·trik di¦vīs }

photoelectric door opener [CONT SYS] A control system that employs a photocell or other photo device, used to open and close a power-operated door. { ¦fōd·ō·i'lek·trik 'dȯr ˌōp·ə·nər }

photoelectric effect *See* photoelectricity. { ¦fōd·ō·i'lek·trik i,fekt }

photoelectric flame-failure detector [CONT SYS] A photoelectric control that cuts off fuel flow when the fuel-consuming flame is extinguished. { ¦fōd·ō·i'lek·trik 'flām ˌfāl·yər di,tek·tər }

photoelectric fluorometer [ENG] Device using a photoelectric cell to measure fluorescence in a chemical sample that has been excited (one or more electrons have been raised to higher energy level) by ultraviolet or visible light; used for analysis of chemical mixtures. { ¦fōd·ō·i'lek·trik flü'räm·əd·ər }

photoelectricity [ELECTR] The liberation of an electric charge by electromagnetic radiation incident on a substance; includes photoemission, photoionization, photoconduction, the photovoltaic effect, and the Auger effect (an internal photoelectric process). Also known as photoelectric effect; photoelectric process. { ¦fōd·ō,i,lek'tris·əd·ē }

photoelectric liquid-level indicator [ENG] A level indicator in which rising liquid interrupts the light beam of a photoelectric control system; used in a tank or process vessel. { ¦fōd·ō·i'lek·trik ¦lik·wəd ¦lev·əl 'in·dəˌkād·ər }

photoelectric loop control [CONT SYS] A photoelectric control system used as a position regulator for a loop of material passing from one strip-processing line to another that may travel at a different speed. Also known as loop control. { ¦fōd·ō·i'lek·trik 'lüp kənˌtrōl }

photoelectric photometer [ENG] A photometer that uses a photocell, phototransistor, or phototube to measure the intensity of light. Also known as electronic photometer. { ¦fōd·ō·i'lek·trik fə'täm·əd·ər }

photoelectric pyrometer [ENG] An instrument that measures high temperatures by using a photoelectric arrangement to measure the radiant energy given off by the heated object. { ¦fōd·ō·i'lek·trik pī'räm·əd·ər }

photoelectric reflectometer [ENG] A reflectometer that uses a photocell or phototube to measure the diffuse reflection of surfaces, powders, pastes, and opaque liquids. { ¦fōd·ō·i'lek·trik ˌrē,flek'täm·əd·ər }

photoelectric register control [CONT SYS] A register control using a light source, one or more phototubes, a suitable optical system, an amplifier, and a relay to actuate control equipment when a change occurs in the amount of light reflected from a moving surface due to register marks, dark areas of a design, or surface defects. Also known as photoelectric scanner. { ¦fōd·ō·i'lek·trik 'rej·ə·stərˌkən,trōl }

photoelectric scanner *See* photoelectric register control. { ¦fōd·ō·i'lek·trik 'skan·ər }

photoelectric smoke-density control [CONT SYS] A photoelectric control system used to measure, indicate, and control the density of smoke in a flue or stack. { ¦fōd·ō·i'lek·trik 'smōk ˌden·səd·ē kənˌtrōl }

photoelectric sorter [CONT SYS] A photoelectric control system used to sort objects according to color, size, shape, or other light-changing characteristics. { ¦fōd·ō·i'lek·trik 'sȯrd·ər }

photoelectric transmissometer [ENG] A device to measure the runway visibility at an airport by measuring the degree to which a light beam falling on a photocell is obscured by clouds or fog. { ¦fōd·ō·i'lek·trik ˌtranz·mə'säm·əd·ər }

photoelectric turbidimeter [ENG] Device for measurement of solution turbidity by use of photocells to detect the loss of intensity of light beamed through the solution. { ¦fōd·ō·i'lek·trik ˌtər·bə'dim·əd·ər }

photoelectromotive force [ELECTR] Electromotive force caused by photovoltaic action. { ¦fōd·ō·i¦lek·trō'mōd·iv 'fȯrs }

photoelectron [ELECTR] An electron emitted by the photoelectric effect. { ¦fōd·ō·i'lekˌträn }

photoemission [ELECTR] The ejection of electrons from a solid (or less commonly, a liquid) by incident electromagnetic radiation. Also known as external photoelectric effect. { ¦fōd·ō·i'mish·ən }

photoemissive tube photometer [ENG] A photometer which uses a tube made of a photoemissive material; it is highly accurate, but requires electronic amplification, and is used mainly in laboratories. { ¦fōd·ō·i'mis·iv ¦tüb fə'täm·əd·ər }

photoemissivity [ELECTR] The property of a substance that emits electrons when struck by light. { ¦fōd·ō,ē·mə'siv·əd·ē }

photofabrication [ELECTR] In manufacturing circuit boards and integrated circuits, a process in which the etching pattern is placed over the circuit board or semiconductor material, the board or chip is placed in a special solution, and the assembly is exposed to light. { ˌfōd·ō,fab·rə'kā·shən }

photoflash bomb [ENG] A missile dropped from aircraft; it contains a photoflash mixture and a means for ignition at a distance above the ground, to produce a brilliant light of short duration for photographic purposes. { 'fōd·əˌflash ˌbäm }

photogoniometer [ENG] A goniometer that uses a phototube or photocell as a sensing device for studying x-ray spectra and x-ray diffraction effects in crystals. { ¦fōd·ōˌgō·nē'äm·əd·ər }

photogrammetry [ENG] **1.** The science of making accurate measurements and maps from aerial photographs. **2.** The practice of obtaining surveys by means of photography. { ˌfōdˈəˈgramˈəˈtrē }

photographic barograph [ENG] A mercury barometer arranged so that the position of the upper or lower meniscus may be measured photographically. { ˌfōdˈəˌgrafˈik ˈbarˈəˌgraf }

photographic interpretation *See* photointerpretation. { ˌfōdˈəˌgrafˈik inˌtərˈprəˈtāˈshən }

photographic surveying [ENG] Photographing of plumb bobs, clinometers, or magnetic needles in borehole surveying to provide an accurate permanent record. { ˌfōdˈəˌgrafˈik sərˈvāˈiŋ }

photointerpretation [ENG] The science of identifying and describing objects in a photograph, such as deducing the topographic significance or the geologic structure of landforms on an aerial photograph. Also known as photographic interpretation. { ˌfōdˈōˈinˌterˈprəˈtāˈshən }

photomask [ELECTR] A film or glass negative that has many high-resolution images, used in the production of semiconductor devices and integrated circuits. { ˈfōdˈōˌmask }

photometer [ENG] An instrument used for making measurements of light or electromagnetic radiation, in the visible range. { fōˈtämˈədˈər }

photon coupling [ELECTR] Coupling of two circuits by means of photons passing through a light pipe. { ˈfōˌtän ˌkəpˈliŋ }

photonegative [ELECTR] Having negative photoconductivity, hence decreasing in conductivity (increasing in resistance) under the action of light; selenium sometimes exhibits photonegativity. { ˌfōdˈōˈnegˈəˈtiv }

photonephelometer [ENG] A nephelometer that uses a photocell or phototube to measure the amount of light transmitted by a suspension of particles. { ˌfōdˈōˌnefˈəˈläməˈdˈər }

photonics [ELECTR] The electronic technology involved with the practical generation, manipulation, analysis, transmission, and reception of electromagnetic energy in the visible, infrared, and ultraviolet portions of the light spectrum. It contributes to many fields, including astronomy, biomedicine, data communications and storage, fiber optics, imaging, optical computing, optoelectronics, sensing, and telecommunications. Also known as optoelectronics. { fōˈtänˈiks }

photopositive [ELECTR] Having positive photoconductivity, hence increasing in conductivity (decreasing in resistance) under the action of light; selenium ordinarily has photopositivity. { ˌfōdˈōˈpäzˈədˈiv }

photoscanner [ENG] A scanner used to make a film record of gamma rays passing through tissue from an injected radioactive material. { ˈfōdˈōˌskanˈər }

photosensitive *See* light-sensitive. { ˌfōdˈōˈsenˈsədˈiv }

phototheodolite [ENG] A ground-surveying instrument used in terrestrial photogrammetry which combines the functions of a theodolite and a camera mounted on the same tripod. { ˌfōdˈōˈthēˈädˈəlˌīt }

photothyristor *See* light-activated silicon controlled rectifier. { ˌfōdˈōˈthīˈrisˈtər }

phototopography [ENG] The science of mapping and surveying in which details are plotted entirely from photographs taken at suitable ground stations. { ˌfōdˈōˈtəˈpägˈrəˈfē }

phototransistor [ELECTR] A junction transistor that may have only collector and emitter leads or also a base lead, with the base exposed to light through a tiny lens in the housing; collector current increases with light intensity, as a result of amplification of base current by the transistor structure. { ˌfōdˈōˈtranˈzisˈtər }

phototriangulation [ENG] The extension of horizontal or vertical control points, or both, by photogrammetric methods, whereby the measurements of angles and distances on overlapping photographs are related into a spatial solution using the perspective principles of the photographs. { ˌfōdˈōˈtrīˌaŋˈgyəˈlāˈshən }

phototube current meter [ENG] A device for measuring the speed of water currents in which a perforated disk, which rotates with the current by means of a propeller, is placed in the path of a beam of light that is then reflected from a mirror onto a phototube. { ˈfōdˈōˌtüb ˈkəˈrənt ˌmēdˈər }

photovoltaic [ELECTR] Capable of generating a voltage as a result of exposure to visible or other radiation. { ˌfōdˈōˈvōlˈtāˈik }

photovoltaic cell [ELECTR] A device that detects or measures electromagnetic radiation by generating a potential at a junction (barrier layer) between two types of material, upon absorption of radiant energy. Also known as barrier-layer cell; barrier-layer photocell; boundary-layer photocell; photronic photocell. { ˌfōdˈōˈvōlˈtāˈik ˌsel }

photovoltaic effect [ELECTR] The production of a voltage in a nonhomogeneous semiconductor, such as silicon, or at a junction between two types of material, by the absorption of light or other electromagnetic radiation. { ˌfōdˈōˈvōlˈtāˈik iˌfekt }

photovoltaic meter [ELECTR] An exposure cell in which a photovoltaic cell produces a current proportional to the light falling on the cell, and this current is measured by a sensitive microammeter. { ˌfōdˈōˈvōlˈtāˈik ˌmēdˈər }

physical compatibility [ENG] The ability of two or more materials, substances, or chemicals to be used together without ill effect. { ˈfizˈəˈkəl kəmˌpadˈəˈbilˈədˈē }

physical modeling synthesis [ENG ACOUS] A method of synthesizing the sounds of a musical instrument that uses computational algorithms that are based directly on the mathematical physics of the instrument. { ˌfizˈiˈkəl ˈmädˈəlˈiŋ ˌsinˈthəˈsəs }

physical realizability [CONT SYS] For a transfer function, the possibility of constructing a net-

work with this transfer function. { 'fiz·ə·kəl ˌrē·əˌlīz·əˈbil·əd·ē }

physical system *See* causal system. { 'fiz·ə·kəl 'sis·təm }

physical testing [ENG] Determination of physical properties of materials based on observation and measurement. { 'fiz·ə·kəl 'test·iŋ }

phytometer [ENG] A device for measuring transpiration, consisting of a vessel containing soil in which one or more plants are rooted and sealed so that water can escape only by transpiration from the plant. { fī'täm·əd·ər }

Picatinny test [ENG] An impact test used in the United States for evaluating the sensitivity of high explosives; a small sample of the explosive is placed in a depression in a steel die cup and capped by a thin brass cover, a cylindrical steel plug is placed in the center of the cover, and a 2-kilogram weight is dropped from varying heights on the plug; the reported sensitivity figure is the minimum height, in inches, at which at least 1 firing results from 10 trials. { pik·əˈtin·ē ˌtest }

Piche evaporimeter [ENG] A porous-paper-wick atmometer. { 'pēsh iˌvap·əˈrim·əd·ər }

pick [DES ENG] **1.** The steel cutting points used on a coal-cutter chain. **2.** A miner's steel or iron digging tool with sharp points at each end. [ENG] **1.** To dress the sides of a shaft or other excavation. **2.** To remove shale, dirt, and such from coal. { pik }

pick-and-place robot [CONT SYS] A simple robot, often with only two or three degrees of freedon and little or no trajectory control, whose sole function is to transfer items from one place to another. { ˌpik ən ˈplās 'rōˌbät }

pickax [DES ENG] A pointed steel or iron tool mounted on a wooden handle and used for breaking earth and stone. { 'pikˌaks }

pick hammer [DES ENG] A hammer with a point at one end of the head and a blunt surface at the other end. { 'pik ˌham·ər }

pick lacing [DES ENG] The pattern to which the picks are set in a cutter chain. { 'pik ˌlās·iŋ }

pickling [CHEM ENG] A method of preparing hides for tanning by immersion in a salt solution with a pH of 2.5 or less. { 'pik·liŋ }

pickoff [ELECTR] A device used to convert mechanical motion into a proportional electric signal. [MECH ENG] A mechanical device for automatic removal of the finished part from a press die. { 'pikˌóf }

pickup [ELEC] **1.** A device that converts a sound, scene, measurable quantity, or other form of intelligence into corresponding electric signals, as in a microphone, phonograph pickup, or television camera. **2.** The minimum current, voltage, power, or other value at which a relay will complete its intended function. **3.** Interference from a nearby circuit or system. { 'pikˌəp }

picoammeter [ENG] An ammeter whose scale is calibrated to indicate current values in picoamperes. { ˌpē·kōˈamˌēd·ər }

picosecond [MECH] A unit of time equal to 10^{-12} second, or one-millionth of a microsecond. Abbreviated ps; psec. { ˌpē·kōˈsek·ənd }

picowatt [MECH] A unit of power equal to 10^{-12} watt, or one-millionth of a microwatt. Abbreviated pW. { 'pē·kəˌwät }

picture element [ELECTR] **1.** That portion, in facsimile, of the subject copy which is seen by the scanner at any instant; it can be considered a square area having dimensions equal to the width of the scanning line. **2.** In television, any segment of a scanning line, the dimension of which along the line is exactly equal to the nominal line width; the area which is being explored at any instant in the scanning process. Also known as critical area; elemental area; pixel; recording spot; scanning spot. { 'pikˌchər ˌel·əˌmənt }

picture window [BUILD] A large window framing an exterior view. { 'pikˌchər ˌwin·dō }

piece mark [ENG] Identification number for an individual part, subassembly, or assembly; shown on the drawing, but not necessarily on the part. { 'pēsˌmärk }

piece rate [IND ENG] Wages paid per unit of production. { 'pēs ˌrāt }

piecewise linear system [CONT SYS] A system for which one can divide the range of values of input quantities into a finite number of intervals such that the output quantity is a linear function of the input quantity within each of these intervals. { 'pēsˌwīz ˌlin·ē·ər ˌsis·təm }

piecework [IND ENG] Work paid for in accordance with the amount done rather than the hours taken. { 'pēsˌwərk }

pier [BUILD] A concrete block that supports the floor of a building. [CIV ENG] **1.** A vertical, rectangular or circular support for concentrated loads from an arch or bridge superstructure. **2.** A structure with a platform projecting from the shore into navigable waters for mooring vessels. { pir }

piercing *See* fusion piercing. { 'pirs·iŋ }

piercing gripper [CONT SYS] A robot component that first punctures a material such as cloth, rubber, or porous sheets, or soft plastic in order to lift and handle it. { 'pirs·iŋ ˌgrip·ər }

pier foundation *See* caisson foundation. { 'pir ˌfaůnˌdā·shən }

pierhead line [CIV ENG] The line in navigable waters beyond which construction is prohibited; open-pier construction may extend outward from the bulkhead line to the pierhead line. { 'pirˌhed ˌlīn }

pièze [MECH] A unit of pressure equal to 1 sthène per square meter, or to 1000 pascals. Abbreviated pz. { pēˈez }

piezoelectric detector [ENG] A seismic detector constructed from a stack of piezoelectric crystals with an inertial mass mounted on top and intervening metal foil to collect the charges produced on the crystal faces when the crystals are strained. { pēˌā·zō·əˈlek·trik diˈtek·tər }

piezoelectric element [ELECTR] A piezoelectric crystal used in an electric circuit, for example, as a transducer to convert mechanical or acoustical

signals to electric signals, or to control the frequency of a crystal oscillator. { pē¦ā·zō·ə'lek·trik 'el·ə·mənt }

piezoelectric gage [ENG] A pressure-measuring gage that uses a piezoelectric material to develop a voltage when subjected to pressure; used for measuring blast pressures resulting from explosions and pressures developed in guns. { pē¦ā·zō·ə'lek·trik 'gāj }

piezoelectric loudspeaker *See* crystal loudspeaker. { pē¦ā·zō·ə'lek·trik 'laud,spēk·ər }

piezoelectric microphone *See* crystal microphone. { pē¦ā·zō·ə'lek·trik 'mī·krə,fōn }

piezoelectric oscillator *See* crystal oscillator. { pē¦ā·zō·ə'lek·trik 'äs·ə,lād·ər }

piezoelectric pickup *See* crystal pickup. { pē¦ā·zō·ə'lek·trik 'pik,əp }

piezoelectric resonator *See* crystal resonator. { pē¦ā·zō·ə'lek·trik 'rez·ən,ād·ər }

piezoelectric transducer [ELECTR] A piezoelectric crystal used as a transducer, either to convert mechanical or acoustical signals to electric signals, as in a microphone, or vice versa, as in ultrasonic metal inspection. { pē¦ā·zō·ə'lek·trik tranz'dü·sər }

piezojunction effect [ELECTR] A change in the current-voltage characteristic of a *pn* junction that is produced by a mechanical stress. { pē,ā·zō'jəŋk·shən i,fekt }

piezometer [ENG] **1.** An instrument for measuring fluid pressure, such as a gage attached to a pipe containing a gas or liquid. **2.** An instrument for measuring the compressibility of materials, such as a vessel that determines the change in volume of a substance in response to hydrostatic pressure. { ,pē·ə'zäm·əd·ər }

piezometer opening *See* pressure tap. { ,pē·ə'zäm·əd·ər ,ō·pən·iŋ }

piezoresistive microphone [ENG ACOUS] A microphone in which a piezoresistive material is deposited on the edges of a membrane, and variations in the resistance of this material resulting from motion of the membrane are sensed, typically in a Wheatstone bridge. { pē¦ā·zō·ri¦zis·tiv 'mī·krə,fōn }

piezoresistive sensor [ENG] A transducer which converts variations in mechanical stress into an electrical output; it consists of an element of piezoresistive material that is connected to a Wheatstone bridge circuit and is placed on a highly stressed part of a suitable mechanical structure, usually attached to a cantilever or other beam configuration. { pē¦ā·zō·ri¦zis·tiv 'sen·sər }

piezotransistor accelerometer [ENG] An accelerometer in which a seismic mass supported by a stylus transmits a concentrated force to the upper diode surface of a transistor and acceleration is determined from the resulting change in current across the *pn* junction of the transistor. { pē¦ā·zō·tran'zis·tər ak,sel·ə'räm·əd·ər }

pi filter [ELECTR] A filter that has a series element and two parallel elements connected in the shape of the Greek letter pi (π). { 'pī ,fil·tər }

pig [ELECTR] **1.** An ion source based on the same principle as the Philips ionization gage. **2.** *See* Philips ionization gage. [ENG] In-line scraper (brush, blade cutter, or swab) forced through pipelines by fluid pressure; used to remove scale, sand, water, and other foreign matter from the interior surfaces of the pipe. { pig }

pigtail [ELEC] A short, flexible wire, usually stranded or braided, used between a stationary terminal and a terminal having a limited range of motion, as in relay armatures. { 'pig,tāl }

pigtail splice [ELEC] A splice made by twisting together the bared ends of parallel conductors. { 'pig,tāl ¦splīs }

pike pole [ENG] **1.** A pole with a sharp metal point in one end that is used to hold utility poles upright while they are being installed. **2.** *See* fire hook. { 'pīk ,pōl }

pilaster [CIV ENG] A vertical rectangular architectural member that is structurally a pier and architecturally a column. { pə'las·tər }

pile [ENG] A long, heavy timber, steel, or reinforced concrete post that has been driven, jacked, jetted, or cast vertically into the ground to support a load. { pīl }

pile bent [CIV ENG] A row of timber or concrete bearing piles with a pile cap forming that part of a trestle which carries the adjacent ends of timber stringers or concrete slabs. { 'pīl ,bent }

pile cap [CIV ENG] A mass of reinforced concrete cast around the head of a group of piles to ensure that they act as a unit to support the imposed load. { 'pīl ,kap }

pile dike [CIV ENG] A dike consisting of a group of piles braced and lashed together along a riverbank. { 'pīl ,dīk }

pile driver [MECH ENG] A hoist and movable steel frame equipped to handle piles and drive them into the ground. { 'pīl ,drīv·ər }

pile extractor [MECH ENG] **1.** A pile hammer which strikes the pile upward so as to loosen its grip and remove it from the ground. **2.** A vibratory hammer which loosens the pile by high-frequency jarring. { 'pīl ik,strak·tər }

pile formula [MECH] An equation for the forces acting on a pile at equilibrium: $P = pA + tS + Sn \sin \phi$, where P is the load, A is the area of the pile point, p is the force per unit area on the point, S is the embedded surface of the pile, t is the force per unit area parallel to S, n is the force per unit area normal to S, and ϕ is the taper angle of the pile. { 'pīl ,fȯr·myə·lə }

pile foundation [CIV ENG] A substructure supported on piles. { 'pīl faún,dā·shən }

pile hammer [MECH ENG] The heavy weight of a pile driver that depends on gravity for its striking power and is used to drive piles into the ground. Also known as drop hammer. { 'pīl ,ham·ər }

pile shoe [CIV ENG] A cast-iron point on the foot of a timber or concrete driven pile to facilitate penetration of the ground. { 'pīl ,shü }

pillar [CIV ENG] A column for supporting part of a structure. { 'pil·ər }

pillar bolt [DES ENG] A bolt projecting from a part so as to support it. { 'pil·ər ,bōlt }

pillar crane [MECH ENG] A crane whose mechanism can be rotated about a fixed pillar. { 'pil·ər ˌkrān }

pillar press [MECH ENG] A punch press framed by two upright columns; the driving shaft passes through the columns, and the slide operates between them. { 'pil·ər ˌpres }

pilot [DES ENG] A bullet-nosed cylindrical component used in a die that enters prepunched holes of a metal strip advancing through a series of operations to assure precise registration at each station. [MECH ENG] A cylindrical steel bar extending through, and about 8 inches (20 centimeters) beyond the face of, a reaming bit; it acts as a guide that follows the original unreamed part of the borehole and hence forces the reaming bit to follow, and be concentric with, the smaller-diameter, unreamed portion of the original borehole. { 'pī·lət }

pilot balloon [ENG] A small balloon whose ascent is followed by a theodolite in order to obtain data for the computation of the speed and direction of winds in the upper air. { 'pī·lət bəˌlün }

pilot bit [DES ENG] A noncoring bit with a cylindrical diamond-set plug of somewhat smaller diameter than the bit proper, set in the center and projecting beyond the main face of the bit. { 'pī·lət ˌbit }

pilot channel [CIV ENG] One of a series of cutoffs for converting a meandering stream into a straight channel of greater slope. { 'pī·lət ˌchan·əl }

pilot drill [MECH ENG] A small drill to start a hole to ensure that a larger drill will run true to center. { 'pī·lət ˌdril }

piloted ignition [ENG] The accidental initiation of combustion by means of contact of gaseous material with an external high-energy source, such as a flame, spark, electrical arc, or glowing wire. { ¦pīl·əd·əd ig'nish·ən }

pilot hole [DES ENG] In metal-forming operations, a prepunched hole in a metal strip into which the pilot component of the die enters in order to assure precise registration of the strip at each work station. [ENG] A small hole drilled ahead of a larger borehole. [MECH ENG] A hole drilled in a piece of wood to serve as a guide for a nail or a screw or for drilling a larger hole. { 'pī·lət ˌhōl }

pilot lamp [ELEC] A small lamp used to indicate that a circuit is energized. Also known as pilot light. { 'pī·lət ˌlamp }

pilot light [ELEC] *See* pilot lamp. [ENG] A small, constantly burning flame used to ignite a gas burner. { 'pī·lət ˌlīt }

pilot line operation [IND ENG] Minimum production of an item in order to preserve or develop the art of its production. { 'pī·lət 'līn ˌäp·əˌrā·shən }

pilot materials [IND ENG] A minimum quantity of special materials, partially finished components, forgings, and castings, identified with specific production equipment and processes and required for the purpose of proofing, tooling, and testing manufacturing processes to facilitate later reactivation. { 'pī·lət məˌtir·ē·əlz }

pilot model [IND ENG] An early production model of a product used to debug the manufacturing process. { 'pī·lət ˌmäd·əl }

pilot plant [IND ENG] A small version of a planned industrial plant, built to gain experience in operating the final plant. { 'pī·lət ¦plant }

pilot reaming bit *See* reaming bit. { 'pī·lət 'rēm·iŋ ˌbit }

pilot-scale chemical reaction [CHEM ENG] Small-scale chemical reaction used to test operating conditions and product yields; used as a pilot for design of large-scale reaction systems. { 'pī·lət ¦skāl ¦kem·ə·kəl rē'ak·shən }

pilot tunnel [ENG] A small tunnel or shaft excavated in advance of the main drivage in mining and tunnel building to gain information about the ground, create a free face, and thus simplify the blasting operations. { 'pī·lət ˌtən·əl }

pilot wire regulator [CONT SYS] Automatic device for controlling adjustable gains or losses associated with transmission circuits to compensate for transmission changes caused by temperature variations, the control usually depending upon the resistance of a conductor or pilot wire having substantially the same temperature conditions as the conductors of the circuits being regulated. { 'pī·lət ¦wīr 'reg·yəˌlād·ər }

pin [DES ENG] **1.** A cylindrical fastener made of wood, metal, or other material used to join two members or parts with freedom of angular movement at the joint. **2.** A short, pointed wire with a head used for fastening fabrics, paper, or similar materials. [ELECTR] A terminal on an electron tube, semiconductor, integrated circuit, plug, or connector. Also known as base pin; prong. { pin }

pinch [ENG] The closing-in of borehole walls before casing is emplaced, resulting from rock failure when drilling in formations having a low compressional strength. { pinch }

pinch bar [DES ENG] A pointed lever, used somewhat like a crowbar, to roll heavy wheels. { 'pinch ˌbär }

pinch grasp [IND ENG] A grasp by the human hand that involves the thumb and the facing side of the index finger at the knuckle; used to apply a large force to a small object. Also known as key grasp. { 'pinch ˌgrasp }

pinch-off blades [ENG] In blow molding, the part that compresses the parison to seal it prior to blowing, and to allow easy cooling and removal of flash. { 'pinchˌȯf ˌblādz }

pinch point [IND ENG] A point in a plant layout or on an automated guided vehicle such that the distance between the automated guided vehicle and the surrounding equipment and structures is so small that it represents a safety hazard to personnel. { 'pinch ˌpȯint }

pinch-tube process [ENG] A plastics blow-molding process in which the extruder drops a tube between mold halves, and the tube is pinched off when the mold closes. { 'pinch ˌtüb ˌprä·səs }

pin diode [ELECTR] A diode consisting of a silicon wafer containing nearly equal *p*-type and *n*-type impurities, with additional *p*-type impurities diffused from one side and additional *n*-type impurities from the other side; this leaves a lightly doped intrinsic layer in the middle, to act as a dielectric barrier between the *n*-type and *p*-type regions. Also known as power diode. { 'pin 'dī,ōd }

pinger [ENG ACOUS] A battery-powered, low-energy source for an echo sounder. { 'piŋ·ər }

pinhole detector [ENG] A photoelectric device that detects extremely small holes and other defects in moving sheets of material. { 'pin,hōl di,tek·tər }

pinion [MECH ENG] The smaller of a pair of gear wheels or the smallest wheel of a gear train. { 'pin·yən }

pin joint [DES ENG] A joint made with a pin hinge which has a removable pin. { 'pin ,jȯint }

pin junction [ELECTR] A semiconductor device having three regions: *p*-type impurity, intrinsic (electrically pure), and *n*-type impurity. { 'pin ,jəŋk·shən }

pinnate joint *See* feather joint. { 'pi,nāt ,jȯint }

pinpoint gate [ENG] In plastics molding, an orifice of 0.030 inch (0.76 millimeter) or less in diameter through which molten resin enters a mold cavity. { 'pin,pȯint ,gāt }

pin rod [DES ENG] A rod designed to connect two parts so they act as one. { 'pin ,räd }

pint [MECH] Abbreviated pt. **1.** A unit of volume, used in the United States for measurement of liquid substances, equal to 1/8 U.S. gallon, or 231/8 cubic inches, or $4.73176473 \times 10^{-4}$ cubic meter. Also known as liquid pint (liq pt). **2.** A unit of volume used in the United States for measurement of solid substances, equal to 1/64 U.S. bushel, or 107,521/3200 cubic inches, or approximately 5.50610×10^{-4} cubic meter. Also known as dry pint (dry pt). **3.** A unit of volume, used in the United Kingdom for measurement of liquid and solid substances, although usually the former, equal to 1/8 imperial gallon, or 5.6826125×10^{-4} cubic meter. Also known as imperial pint. { pīnt }

pintle [DES ENG] A vertical pivot pin, as on a rudder or a gun carriage. { 'pint·əl }

pintle chain [DES ENG] A chain with links held together by pivot pins; used with sprocket wheels. { 'pint·əl ,chān }

pin-type mill [MECH ENG] Solids pulverizer in which protruding pins on high-speed rotating disk provide the breaking energy. { 'pin ,tīp ,mil }

pipe [DES ENG] A tube made of metal, clay, plastic, wood, or concrete and used to conduct a fluid, gas, or finely divided solid. { pīp }

pipe bit [DES ENG] A bit designed for attachment to standard coupled pipe for use in socketing the pipe in bedrock. { 'pīp ,bit }

pipebox [ENG] In a pipework installation, a casing packed with loose insulation to enclose a set of pipes. { 'pīp,bäks }

pipe clamp [DES ENG] A device similar to a casing clamp, but used on a pipe to grasp it and facilitate hoisting or suspension. { 'pīp ,klamp }

pipe culvert [CIV ENG] A buried pipe for carrying a watercourse below ground level. { 'pīp ,kəl·vərt }

pipe cutter [DES ENG] A hand tool consisting of a clamplike device with three cutting wheels which are forced inward by screw pressure to cut into a pipe as the tool is rotated around the pipe circumference. { 'pīp ,kəd·ər }

pipe elbow meter [ENG] A variable-head meter for measuring flow around the bend in a pipe. { 'pīp 'el·bō ,mēd·ər }

pipe fitter [ENG] A technician who fits, threads, installs, and repairs pipes in a pipework system. { 'pīp ,fid·ər }

pipe fitting [ENG] A piece, such as couplings, unions, nipples, tees, and elbows for connecting lengths of pipes. { 'pīp ,fid·iŋ }

pipe flow [ENG] Conveyance of fluids in closed conduits. { 'pīp ,flō }

pipe laying [ENG] The placing of pipe into position in a trench, as with buried pipelines for oil, water, or chemicals. { 'pīp ,lā·iŋ }

pipeline [ENG] A line of pipe connected to valves and other control devices, for conducting fluids, gases, or finely divided solids. { 'pīp,līn }

pipe pile [CIV ENG] A steel pipe 6–30 inches (15–76 centimeters) in diameter, usually filled with concrete and used for underpinning. { 'pīp ,pīl }

pipe run [ENG] The path followed by a piping system. { 'pīp ,rən }

pipe scale [ENG] Rust and corrosion products adhering to the inner surfaces of pipes; serve to decrease ability to transfer heat and to increase the pressure drop for flowing fluids. { 'pīp ,skāl }

pipe sleeve [ENG] A hollow, cylindrical insert placed in a form for a concrete wall at the position where a pipe is to penetrate in order to prevent flow of concrete into the opening. { 'pīp ,slēv }

pipe still [CHEM ENG] A petroleum-refinery still in which heat is applied to the oil while it is being pumped through a coil or pipe arranged in a firebox, the oil then running to a fractionator with continuous removal of overhead vapor and liquid bottoms. { 'pīp ,stil }

pipe tap [ENG] A small threaded hole or entry made into the wall of a pipe; used for sampling of pipe contents, or connection of control devices or pressure-drop-measurement devices. { 'pīp ,tap }

pipe tee [DES ENG] A T-shaped pipe fitting with two outlets, one at 90° to the connection to the main line. { 'pīp ,tē }

pipe thread [DES ENG] Most commonly, a 60° thread used on pipes and tubes, characterized by flat crests and roots and cut with 3/4-inch taper per foot (about 1.9 centimeters per 30 centimeters). Also known as taper pipe thread. { 'pīp ,thred }

pipe-thread protector *See* thread protector. { 'pīp ˌthred prəˌtek·tər }
pipe tongs [ENG] Heavy tongs that are hung on a cable and used for screwing pipe and tool joints. { 'pīp ˌtäŋz }
pipe train [ENG] In the extrusion of plastic pipe, the entire equipment assembly used to fabricate the pipe (such as the extruder, die, cooling bath, haul-off, and cutter). { 'pīp ˌtrān }
pipework *See* piping. { 'pīpˌwərk }
pipe wrench [DES ENG] A tool designed to grip and turn a pipe or rod about its axis in one direction only. { 'pīp ˌrench }
piping [ENG] A system of pipes provided to carry a fluid. Also known as pipework. { 'pīp·iŋ }
piston [ENG] *See* force plug. [MECH ENG] A sliding metal cylinder that reciprocates in a tubular housing, either moving against or moved by fluid pressure. { 'pis·tən }
piston blower [MECH ENG] A piston-operated, positive-displacement air compressor used for stationary, automobile, and marine duty. { 'pis·tən ˈblō·ər }
piston corer [MECH ENG] A steel tube which is driven into the sediment by a free fall and by lead attached to the upper end, and which is capable of recovering undistorted vertical sections of sediment. { 'pis·tən ˈkȯr·ər }
piston displacement [MECH ENG] The volume which a piston in a cylinder displaces in a single stroke, equal to the distance the piston travels times the internal cross section of the cylinder. { 'pis·tən diˌsplās·mənt }
piston drill [MECH ENG] A heavy percussion-type rock drill mounted either on a horizontal bar or on a short horizontal arm fastened to a vertical column; drills holes to 6 inches (15 centimeters) in diameter. Also known as reciprocating drill. { 'pis·tən ˈdril }
piston engine [MECH ENG] A type of engine characterized by reciprocating motion of pistons in a cylinder. Also known as displacement engine; reciprocating engine. { 'pis·tən ˈen·jən }
piston gage *See* free-piston gage. { 'pis·tən ˌgāj }
piston head [MECH ENG] That part of a piston above the top ring. { 'pis·tən ˌhed }
piston meter [ENG] A variable-area, constant-head fluid-flow meter in which the position of the piston, moved by the buoyant force of the liquid, indicates the flow rate. Also known as piston-type area meter. { 'pis·tən ˈmēd·ər }
pistonphone [ENG ACOUS] A small chamber equipped with a reciprocating piston having a measurable displacement and used to establish a known sound pressure in the chamber, as for testing microphones. { 'pis·tənˌfōn }
piston pin [MECH ENG] A cylindrical pin that connects the connecting rod to the piston. Also known as wrist pin. { 'pis·tən ˌpin }
piston pump [MECH ENG] A pump in which motion and pressure are applied to the fluid by a reciprocating piston in a cylinder. Also known as reciprocating pump. { 'pis·tən ˈpəmp }
piston ring [DES ENG] A sealing ring fitted around a piston and extending to the cylinder wall to prevent leakage. Also known as packing ring. { 'pis·tən ˌriŋ }
piston rod [MECH ENG] The rod which is connected to the piston, and moves or is moved by the piston. { 'pis·tən ˌräd }
piston skirt [MECH ENG] That part of a piston below the piston pin bore. { 'pis·tən ˌskərt }
piston speed [MECH ENG] The total distance a piston travels in a given time; usually expressed in feet per minute. { 'pis·tən ˌspēd }
piston-type area meter *See* piston meter. { 'pis·tən ˌtīp 'er·ē·ə ˌmēd·ər }
piston valve [MECH ENG] A cylindrical type of steam engine slide valve for admission and exhaust of steam. { 'pis·tən ˈvalv }
piston viscometer [ENG] A device for the measurement of viscosity by the timed fall of a piston through the liquid being tested. { 'pis·tən viˈskäm·əd·ər }
pitch [DES ENG] The distance between similar elements arranged in a pattern or between two points of a mechanical part, as the distance between the peaks of two successive grooves on a disk recording or on a screw. [MECH] **1.** Of an aerospace vehicle, an angular displacement about an axis parallel to the lateral axis of the vehicle. **2.** The rising and falling motion of the bow of a ship or the tail of an airplane as the craft oscillates about a transverse axis. { pich }
pitch acceleration [MECH] The angular acceleration of an aircraft or missile about its lateral, or Y, axis. { 'pich ikˌsel·əˌrā·shən }
pitch attitude [MECH] The attitude of an aircraft, rocket, or other flying vehicle, referred to the relationship between the longitudinal body axis and a chosen reference line or plane as seen from the side. { 'pich ˌad·əˌtüd }
pitch axis [MECH] A lateral axis through an aircraft, missile, or similar body, about which the body pitches. Also known as pitching axis. { 'pich ˌak·səs }
pitch circle [DES ENG] In toothed gears, an imaginary circle concentric with the gear axis which is defined at the thickest point on the teeth and along which the tooth pitch is measured. { 'pich ˌsər·kəl }
pitch cone [DES ENG] A cone representing the pitch surface of a bevel gear. { 'pich ˌkōn }
pitch cylinder [DES ENG] A cylinder representing the pitch surface of a spur gear. { 'pich ˌsil·ən·dər }
pitch diameter [DES ENG] The diameter of the pitch circle of a gear. { 'pich dīˌam·əd·ər }
pitched roof [BUILD] **1.** A roof that has one or more surfaces with a slope greater than 10°. **2.** A roof that has two slopes meeting at a central ridge. { ˈpicht 'rüf }
pitching axis *See* pitch axis. { 'pich·iŋ ˌak·səs }
pitching moment [MECH] A moment about a lateral axis of an aircraft, rocket, or airfoil. { 'pich·iŋ ˌmō·mənt }
pitch line *See* cam profile. { 'pich ˌlīn }
pitman [ENG] **1.** A worker in or near a pit, as in a quarry, mine, garage, or foundry. **2.** On a

pumping unit, an arm connecting the crank with the walking beam for converting rotary motion to reciprocating motion. [MECH ENG] In an automotive steering system, the arm that is connected to the shaft of the steering gear sector and the tie rod, and swings back and forth as the steering wheel is turned. Also known as pitman arm. { 'pit·mən }

pitman arm *See* pitman. { 'pit·mən ˌärm }

pitometer [ENG] Reversed pitot-tube-type flow-measurement device with one pressure opening facing upstream and the other facing downstream. { pə'täm·əd·ər }

pitometer log [ENG] A log consisting essentially of a pitot tube projecting into the water, and suitable registering devices. { pə'täm·əd·ər ˌläg }

pitot tube [ENG] An instrument that measures the stagnation pressure of a flowing fluid, consisting of an open tube pointing into the fluid and connected to a pressure-indicating device. Also known as impact tube. { pē'tō ˌtüb }

pitot-tube anemometer [ENG] A pressure-tube anemometer consisting of a pitot tube mounted on the windward end of a wind vane and a suitable manometer to measure the developed pressure, and calibrated in units of wind speed. { pē'tō ˌtüb ˌan·ə'mäm·əd·ər }

pitot-venturi flow element [ENG] Liquid-flow measurement device in which a pair of concentric venturi elements replaces the pitot-tube probe. { pē'tō ven'tůr·ē ¦flō ˌel·ə·mənt }

pivot [MECH] A short, pointed shaft forming the center and fulcrum on which something turns, balances, or oscillates. { 'piv·ət }

pivot anchor [DES ENG] An anchor that permits a pipe to swivel around a fixed point. { 'piv·ət ˌaŋ·kər }

pivot bridge [CIV ENG] A bridge in which a span can open by pivoting about a vertical axis. { 'piv·ət 'brij }

pivot-bucket conveyor-elevator [MECH ENG] A bucket conveyor having overlapping pivoted buckets on long-pitch roller chains; buckets are always level except when tripped to discharge materials. { 'piv·ət ˌbək·ət kən¦vā·ər 'el·əˌvād·ər }

pivoted window [BUILD] A window having a section which is pivoted near the center so that the top of the section swings in and the bottom swings out. { 'piv·əd·əd 'win·dō }

pixel [ELECTR] The smallest addressable element in an electronic display; a short form for picture element. Also known as pel. { pik'sel }

pk *See* peck.

plain concrete [CIV ENG] Concrete without reinforcement but often with light steel to reduce shrinkage and temperature cracking. { 'plān kän'krēt }

plain-laid [DES ENG] Pertaining to a rope whose strands are twisted together in a direction opposite to that of the twist in the strands. { 'plānˌlād }

plain milling cutter [DES ENG] A cylindrical milling cutter with teeth on the periphery only; used for milling plain or flat surfaces. Also known as slab cutter. { 'plān ¦mil·iŋ ˌkəd·ər }

plain turning [MECH ENG] Lathe operations involved when machining a workpiece between centers. { 'plān ¦tərn·iŋ }

planar linkage [MECH ENG] A linkage that involves motion in only two dimensions. { 'plā·nər 'liŋ·kij }

planar process [ENG] A silicon-transistor manufacturing process in which a fractional-micrometer-thick oxide layer is grown on a silicon substrate; a series of etching and diffusion steps is then used to produce the transistor inside the silicon substrate. { 'plā·nər ˌprä·səs }

planchet [ENG] A small metal container or sample holder; usually used to hold radioactive materials that are being checked for the degree of radioactivity in a proportional counter or scintillation detector. { 'plan·chət }

Planck function [THERMO] The negative of the Gibbs free energy divided by the absolute temperature. { 'pläŋk ˌfəŋk·shən }

plane [DES ENG] A tool consisting of a smooth-soled stock from the face of which extends a wide-edged cutting blade for smoothing and shaping wood. [ELECTR] Screen of magnetic cores; planes are combined to form stacks. { plān }

plane correction [ENG] A correction applied to observed surveying data to reduce them to a common reference plane. { 'plān kəˌrek·shən }

plane lamina [MECH] A body whose mass is concentrated in a single plane. { 'plān 'lam·ə·nə }

plane of departure [MECH] Vertical plane containing the path of a projectile as it leaves the muzzle of the gun. { 'plān əv di'pär·chər }

plane of fire [MECH] Vertical plane containing the gun and the target, or containing a line of site. { 'plān əv 'fīr }

plane of maximum shear stress [MECH] Either of two planes that lie on opposite sides of and at angels of 45° to the maximum principal stress axis and that are parallel to the intermediate principal stress axis. { 'plān əv ¦mak·si·məm 'shir ˌstres }

plane of work [IND ENG] The plane in which most of a worker's motions occur in the performance of a task. { 'plān əv 'wərk }

plane of yaw [MECH] The plane determined by the tangent to the trajectory of a projectile in flight and the axis of the projectile. { 'plān əv 'yȯ }

plan equation [MECH ENG] The mathematical statement that horsepower = $plan/33{,}000$, where p = mean effective pressure (pounds per square inch), l = length of piston stroke (feet), a = net area of piston (square inches), and n = number of cycles completed per minute. { 'plan iˌkwā·zhən }

planer [MECH ENG] A machine for the shaping of long, flat, or flat contoured surfaces by recipro-

cating the workpiece under a stationary single-point tool or tools. { 'plān·ər }

plane strain [MECH] A deformation of a body in which the displacements of all points in the body are parallel to a given plane, and the values of these displacements do not depend on the distance perpendicular to the plane. { 'plān ˌstrān }

plane stress [MECH] A state of stress in which two of the principal stresses are always parallel to a given plane and are constant in the normal direction. { 'plān ˌstres }

plane surveying [ENG] Measurement of areas on the assumption that the earth is flat. { 'plān sərˈvā·iŋ }

plane table [ENG] A surveying instrument consisting of a drawing board mounted on a tripod and fitted with a compass and a straight-edge ruler; used to graphically plot survey lines directly from field observations. { 'plān ˌtā·bəl }

planetary gear train [MECH ENG] An assembly of meshed gears consisting of a central gear, a coaxial internal or ring gear, and one or more intermediate pinions supported on a revolving carrier. { 'plan·əˌter·ē 'gir ˌtrān }

planet carrier [MECH ENG] A fixed member in a planetary gear train that contains the shaft upon which the planet pinion rotates. { 'plan·ət ˈkar·ē·ər }

planet gear [MECH ENG] A pinion in a planetary gear train. { 'plan·ət ˌgir }

planet pinion [MECH ENG] One of the gears in a planetary gear train that meshes with and revolves around the sun gear. { 'plan·ət ˌpin·yən }

planimeter [ENG] A device used for measuring the area of any plane surface by tracing the boundary of the area. { plə'nim·əd·ər }

planing [ENG] Smoothing or shaping the surface of wood, metal, or plastic workpieces. { 'plān·iŋ }

planishing [MECH ENG] Smoothing the surface of a metal by a rapid series of overlapping, light hammerlike blows or by rolling in a planishing mill. { 'plan·ish·iŋ }

plankton net [ENG] A net for collecting plankton. { 'plaŋk·tən ˌnet }

planning horizon [IND ENG] In a materials-requirements planning system, the time from the present to some future date for which plans are being generated for acquisition of materials. { 'plan·iŋ həˌrīz·ən }

plant [IND ENG] The land, buildings, and equipment used in an industry. { plant }

plant decomposition [CONT SYS] The partitioning of a large-scale control system into subsystems along lines of weak interaction. { 'plant dēˌkäm·pə'zish·ən }

plant factor [ELEC] The ratio of the average power load of an electric power plant to its rated capacity. Also known as capacity factor. { 'plant ˌfak·tər }

plant layout [IND ENG] The location of equipment and facilities in a manufacturing plant. { 'plant ˌlāˌaút }

plant protection [IND ENG] That portion of industrial security which concerns the safeguarding of industrial installations, resources, utilities, and materials by physical measures such as guards, fences, and lighting designation of restricted areas. { 'plant prəˌtek·shən }

plasma-arc cutting [ENG] Metal cutting by melting a localized area with an arc followed by removal of metal by high-velocity, high-temperature ionized gas. { 'plaz·mə ˈärk 'kəd·iŋ }

plasma processing [ENG] Methods and technologies that utilize a plasma to treat and manufacture materials, generally through etching, deposition, or chemical alteration at a surface inside or at the boundary of the plasma. { 'plaz·mə präˌses·iŋ }

plasma-source ion implantation [ENG] A method of ion implantation in which the workpiece is placed in a plasma containing the appropriate ion species and is repetitively pulse-biased to a high negative potential so that positive plasma ions are accelerated to the surface and implant in the bulk material. Abbreviated PSII. { ˈplaz·mə ˌsȯrs 'ī·ən ˌim·plan,tā·shən }

plasma torch [ENG] A torch in which temperatures as high as 50,000°C are achieved by injecting a plasma gas tangentially into an electric arc formed between electrodes in a chamber; the resulting vortex of hot gases emerges at very high speed through a hole in the negative electrode, to form a jet for welding, spraying of molten metal, and cutting of hard rock or hard metals. { 'plaz·mə ˌtȯrch }

plaster coat [BUILD] A thin layer of plaster lining walls in buildings. { 'plas·tər ˈkōt }

plaster ground [BUILD] A piece of wood used as a gage to control the thickness of a plaster coat placed on a wall; usually put around windows and doors and at the floor. { 'plas·tər ˈgraůnd }

plaster shooting [ENG] A surface blasting method used when no rock drill is necessary or one is not available; consists of placing a charge of gelignite, primed with safety fuse and detonator, in close contact with the rock or boulder and covering it completely with stiff damp clay. { 'plas·tər 'shüd·iŋ }

plastic [MECH] Displaying, or associated with, plasticity. { 'plas·tik }

plasticate [ENG] To soften a material by heating or kneading. Also known as plastify. { 'plas·təˌkāt }

plastic bonding [ENG] The joining of plastics by heat, solvents, adhesives, pressure, or radio frequency. { 'plas·tik 'bänd·iŋ }

plastic collision [MECH] A collision in which one or both of the colliding bodies suffers plastic deformation and mechanical energy is dissipated. { ˈplas·tik kə'lizh·ən }

plastic deformation [MECH] Permanent change in shape or size of a solid body without fracture resulting from the application of sustained stress beyond the elastic limit. { 'plas·tik ˌdē,fȯr'mā·shən }

plastic design *See* ultimate-load design. { 'plas·tik di'zīn }

plasticity [MECH] The property of a solid body whereby it undergoes a permanent change in shape or size when subjected to a stress exceeding a particular value, called the yield value. { plas'tis·əd·ē }

plasticize [ENG] To soften a material to make it plastic or moldable by adding a plasticizer or by using heat. { 'plas·tə,sīz }

plasticorder [ENG] Laboratory device used to predict the performance of a plastic material by measurement of temperature, viscosity, and shear-rate relationships. Also known as plastigraph. { 'plas·tə,kȯrd·ər }

plasticoviscosity [MECH] Plasticity in which the rate of deformation of a body subjected to stresses greater than the yield stress is a linear function of the stress. { ¦plas·tə·kō·vi'skäs·əd·ē }

plastify *See* plasticate. { 'plas·tə,fī }

plastigraph *See* plasticorder. { 'plas·tə,graf }

plastometer [ENG] Instrument used to determine the flow properties of a thermoplastic resin by forcing molten resin through a specified die opening or orifice at a given pressure and temperature. { pla'stäm·əd·ər }

plate [BUILD] **1.** A shoe or base member, such as of a partition or other kind of frame. **2.** The top horizontal member of a row of studs used in a frame wall. [DES ENG] A rolled, flat piece of metal of some arbitrary minimum thickness and width depending on the type of metal. [ELEC] **1.** One of the conducting surfaces in a capacitor. **2.** One of the electrodes in a storage battery. [ELECTR] *See* anode. { plāt }

plate anemometer *See* pressure-plate anemometer. { 'plāt ˌan·ə'mäm·əd·ər }

plate bearing test [ENG] Former method to estimate the bearing capacity of a soil; a rigid steel plate about 1 foot (30 centimeters) square was placed on the foundation level and then loaded until the foundation failed, as evidenced by rapid sinking of the plate. { 'plāt 'ber·iŋ ˌtest }

plate-belt feeder *See* apron feeder. { 'plāt ˌbelt ˌfēd·ər }

plate cam [MECH ENG] A flat, open cam that imparts a sliding motion. { 'plāt ˌkam }

plate coil [MECH ENG] Heat-transfer device made from two metal sheets held together, one or both plates embossed to form passages between them for a heating or cooling medium to flow through. Also known as panel coil. { 'plāt ¦kȯil }

plate conveyor [MECH ENG] A conveyor with a series of steel plates as the carrying medium; each plate is a short trough, all slightly overlapped to form an articulated band, and attached to one center chain or to two side chains; the chains join rollers running on an angle-iron framework and transmit the drive from the driveheads, installed at intermediate points and sometimes also at the head or tail ends. { 'plāt kən,vā·ər }

plate cut [BUILD] The cut made in a rafter to rest on the plate. { 'plāt ˌkət }

plated circuit [ELECTR] A printed circuit produced by electrodeposition of a conductive pattern on an insulating base. Also known as plated printed circuit. { 'plād·əd 'sər·kət }

plated printed circuit *See* plated circuit. { 'plād·əd 'print·əd 'sər·kət }

plate efficiency [CHEM ENG] The equilibrium produced by an actual plate of a distillation column or countercurrent tower extractor compared with that of a perfect plate, expressed as a ratio. [ELECTR] *See* anode efficiency. { 'plāt iˌfish·ən·sē }

plate feeder *See* apron feeder. { 'plāt ¦fēd·ər }

plate-fin exchanger [MECH ENG] Heat-transfer device made up of a stack or layers, with each layer consisting of a corrugated fin between flat metal sheets sealed off on two sides by channels or bars to form passages for the flow of fluids. { 'plāt ˌfin iks,chān·jər }

plate girder [CIV ENG] A riveted or welded steel girder having a deep vertical web plate with a pair of angles along each edge to act as compression and tension flanges. { 'plāt ˌgərd·ər }

plate girder bridge [CIV ENG] A fixed bridge consisting, in its simplest form, of two flange plates welded to a web plate in the overall shape of an I. { 'plāt ¦gərd·ər ˌbrij }

plate modulus [MECH] The ratio of the stress component T_{xx} in an isotropic, elastic body obeying a generalized Hooke's law to the corresponding strain component S_{xx}, when the strain components S_{yy} and S_{zz} are 0; the sum of the Poisson ratio and twice the rigidity modulus. { 'plāt ˌmäj·ə·ləs }

platen [ENG] **1.** A flat plate against which something rests or is pressed. **2.** The rubber-covered roller of a typewriter against which paper is pressed when struck by the typebars. [MECH ENG] A flat surface for exchanging heat in a boiler or heat exchanger which may have extended heat transfer surfaces. { 'plat·ən }

plate-shear test [ENG] A method used to get true shear data on a honeycomb core by bonding the core between two thick steel plates and subjecting the core to shear by displacing the plates relative to each other by loading in either tension or compression. { 'plāt ¦shir ˌtest }

plate tower [CHEM ENG] A distillation tower along the internal height of which is a series of transverse plates (bubble-cap or sieve) to force intimate contact between downward flowing liquid and upward flowing vapor. { 'plāt ˌtaü·ər }

plate-type exchanger [MECH ENG] Heat-exchange device similar to a plate-and-frame filter press; fluids flow between the frame-held plates, transferring heat between them. { 'plāt ˌtīp iks,chān·jər }

plate vibrator [ENG] A mechanically operated tamper fitted with a flat base. { 'plāt vī'brād·ər }

platform balance [ENG] A weighing device with a flat plate mounted above a balanced beam. { 'plat,fȯrm ˌbal·ənts }

platform blowing [ENG] Special technique for

blow-molding large parts made of plastic without sagging of the part being formed. { 'plat ˌfȯrm ˌblō·iŋ }

platform conveyor [MECH ENG] A single- or double-strand conveyor with plates of steel or hardwood forming a continuous platform on which the loads are placed. { 'platˌfȯrm kən ˌvā·ər }

platform framing [BUILD] A construction method in which each floor is framed independently by nailing the horizontal framing member to the top of the wall studs. { 'platˌfȯrm ˌfrām·iŋ }

platinum resistance thermometer [ENG] The basis of the International Practical Temperature Scale of 1968 from 259.35° to 630.74°C; used in industrial thermometers in the range 0 to 650°C; capable of high accuracy because platinum is noncorrosive, ductile, and nonvolatile, and can be obtained in a very pure state. Also known as Callendar's thermometer. { 'plat·ən·əm riˌzis·təns thər'mäm·əd·ər }

play [MECH ENG] Free or unimpeded motion of an object, such as the motion between poorly fitted or worn parts of a mechanism. { plā }

playback [ENG ACOUS] Reproduction of a sound recording. { 'plāˌbak }

playback robot [CONT SYS] A robot that repeats the same sequence of motions in all its operations, and is first instructed by an operator who puts it through this sequence. { 'plāˌbak 'rōˌbät }

play for position [IND ENG] The prepositioning of an object by a worker for a subsequent operation in the performance of a task. { 'plā fȯr pə'zish·ən }

pleated cartridge [DES ENG] A filter cartridge made into a convoluted form that resembles the folds of an accordion. { 'plēd·əd 'kär·trij }

plenum [ENG] A condition in which air pressure within an enclosed space is greater than that in the outside atmosphere. { 'plen·əm }

plenum blower assembly [MECH ENG] In an automotive air-conditioning system, the assembly through which air passes on its way to the evaporator or heater core. { ˌplē·nəm 'blō·ər əˌsem·blē }

plenum chamber [ENG] An enclosed space in which a plenum condition exists; air is forced into it for slow distribution through ducts. { 'plen·əm ˌchām·bər }

plenum system [MECH ENG] A heating or air conditioning system in which air is forced through a plenum chamber for distribution to ducts. { 'plen·əm ˌsis·təm }

pli [MECH] A unit of line density (mass per unit length) equal to 1 pound per inch, or approximately 17.8580 kilograms per meter. { plē }

pliers [DES ENG] A small instrument with two handles and two grasping jaws, usually long and roughened, working on a pivot; used for holding small objects and cutting, bending, and shaping wire. { 'plī·ərz }

plinth block *See* skirting block. { 'plinth ˌbläk }

plot [CIV ENG] A measured piece of land. { plät }

plotter [ENG] A visual display or board on which a dependent variable is graphed by an automatically controlled pen or pencil as a function of one or more variables. { 'pläd·ər }

plotting board [ENG] The surface portion of a plotter, on which graphs are recorded. Also known as plotting table. { 'pläd·iŋ ˌbȯrd }

plotting table *See* plotting board. { 'pläd·iŋ ˌtā·bəl }

plough [ENG] A groove cut lengthwise with the grain in a piece of wood. { plaù }

ploughed-and-tongued joint *See* feather joint. { ˌplaùd ən 'təŋd ˌjȯint }

plowshare [DES ENG] The pointed part of a moldboard plow, which penetrates and cuts the soil first. { 'plauˌsher }

plug [ELEC] The half of a connector that is normally movable and is generally attached to a cable or removable subassembly; inserted in a jack, outlet, receptacle, or socket. { pləg }

plug-and-feather hole [ENG] A hole drilled in quarries for the purpose of splitting a block of stone by the plug-and-feather method. { ˌpləg ən 'feth·ər ˌhōl }

plug bit *See* noncoring bit. { 'pləg ˌbit }

plug cock *See* plug valve. { 'pləg ˌkäk }

plug cutter [DES ENG] A device for boring out short dowels or plugs from wood that exactly match standard drill sizes. { 'pləg ˌkəd·ər }

plug forming [ENG] Thermoforming process for plastics molding in which a plug or male mold is used to partially preform the part before forming is completed, using vacuum or pressure. { 'pləg ˌfȯrm·iŋ }

plug gage [DES ENG] A steel gage that is used to test the dimension of a hole; may be straight or tapered, plain or threaded, and of any cross-sectional shape. { 'pləg ˌgāj }

plugging [ELEC] Braking an electric motor by reversing its connections, so it tends to turn in the opposite direction; the circuit is opened automatically when the motor stops, so the motor does not actually reverse. [ENG] The formation of a barrier (plug) of solid material in a process flow system, such as a pipe or reactor. { 'pləg·iŋ }

plug meter [ENG] A variable-area flowmeter in which a tapered plug, located in an orifice and raised until the resulting opening is sufficient to handle the fluid flow, is used to measure the flow rate. { 'pləg ˌmēd·ər }

plug valve [MECH ENG] A valve fitted with a plug that has a hole through which fluid flows and that is rotatable through 90° for operation in the open or closed position. Also known as plug cock. { 'pləg ˌvalv }

plumb [ENG] Pertaining to an object or structure in true vertical position as determined by a plumb bob. { pləm }

plumb bob [ENG] A weight suspended on a string to indicate the direction of the vertical. { 'pləm ˌbäb }

plumb bond [CIV ENG] A masonry bond in

which corresponding joints (for example, on alternate courses) are aligned. { 'pləm ˌbänd }

plumbing [CIV ENG] The system of pipes and fixtures concerned with the introduction, distribution, and disposal of water in a building. { 'pləm·iŋ }

plumb line [ENG] The string on which a plumb bob hangs. { 'pləm ˌlīn }

plummet [ENG] A loose-fitting metal plug in a tapered rotameter tube which moves upward (or downward) with an increase (or decrease) in fluid flow rate upward through the tube. Also known as float. { 'pləm·ət }

plunge [ENG] To set the horizontal cross hair of a theodolite in the direction of a grade when establishing a grade between two points of known level. { plənj }

plunge grinding [MECH ENG] Grinding in which the wheel moves radially toward the work. { 'plənj ˌgrīnd·iŋ }

plunger [DES ENG] A wooden shaft with a large rubber suction cup at the end, used to clear plumbing traps and waste outlets. [ENG] *See* force plug. [MECH ENG] The long rod or piston of a reciprocating pump. { 'plən·jər }

plunger pump [MECH ENG] A reciprocating pump where the packing is on the stationary casing instead of the moving piston. { 'plən·jər ˌpəmp }

plunger-type instrument [ENG] Moving-iron instrument in which the pointer is attached to a long and specially shaped piece of iron that is drawn into or moved out of a coil carrying the current to be measured. { 'plən·jər ˌtīp 'in·strə·mənt }

pluviograph *See* recording rain gage. { 'plü·vē·əˌgraf }

pluviometer *See* rain gage. { ˌplü·vē'äm·əd·ər }

PMOS [ELECTR] Metal-oxide semiconductors that are made on *n*-type substrates, and whose active carriers are holes that migrate between *p*-type source and drain contacts. Derived from *p*-channel metal-oxide semiconductor. { 'pēˌmōs }

pneumatic [ENG] Pertaining to or operated by air or other gas. { nù'mad·ik }

pneumatic atomizer [MECH ENG] An atomizer that uses compressed air to produce drops in the diameter range of 5–100 micrometers. { nù'mad·ik 'ad·əˌmīz·ər }

pneumatic caisson [CIV ENG] A caisson having a chamber filled with compressed air at a pressure equal to the pressure of the water outside. { nù'mad·ik 'kāˌsän }

pneumatic controller [MECH ENG] A device for the mechanical movement of another device (such as a valve stem) whose action is controlled by variations in pneumatic pressure connected to the controller. { nù'mad·ik kən'trōl·ər }

pneumatic control valve [MECH ENG] A valve in which the force of compressed air against a diaphragm is opposed by the force of a spring to control the area of the opening for a fluid stream. { nù'mad·ik kən'trōl ˌvalv }

pneumatic conveyor [MECH ENG] A conveyor which transports dry, free-flowing, granular material in suspension, or a cylindrical carrier, within a pipe or duct by means of a high-velocity airstream or by pressure of vacuum generated by an air compressor. Also known as air conveyor. { nù'mad·ik kən'vā·ər }

pneumatic drill [MECH ENG] Compressed-air drill worked by reciprocating piston, hammer action, or turbo drive. { nù'mad·ik 'dril }

pneumatic drilling [MECH ENG] Drilling a hole when using air or gas in lieu of conventional drilling fluid as the circulating medium; an adaptation of rotary drilling. { nù'mad·ik 'dril·iŋ }

pneumatic hammer [MECH ENG] A hammer in which compressed air is utilized for producing the impacting blow. Also known as air hammer; jack hammer. { nù'mad·ik 'ham·ər }

pneumatic hoist *See* air hoist. { nù'mad·ik 'hȯist }

pneumatic loudspeaker [ENG ACOUS] A loudspeaker in which the acoustic ouput results from controlled variation of an airstream. { nù'mad·ik 'laùdˌspēk·ər }

pneumatic riveter [MECH ENG] A riveting machine having a rapidly reciprocating piston driven by compressed air. { nù'mad·ik 'riv·əd·ər }

pneumatic servo *See* valve positioner.

pneumatic servomechanism [CONT SYS] A servomechanism in which power is supplied and transmission of signals is carried out through the medium of compressed air. { nù'mad·ik ˌsər·vō 'mek·əˌniz·əm }

pneumatic telemetering [ENG] The transmission of a pressure impulse by means of pneumatic pressure through a length of small-bore tubing; used for remote transmission of signals from primary process-unit sensing elements for pressure, temperature, flow rate, and so on. { nù'mad·ik 'telˌə·mēd·ə·riŋ }

pneumatic test [ENG] Pressure testing of a process vessel by the use of air pressure. { nù 'mad·ik 'test }

pneumatic weighing system [ENG] A system for weight measurement in which the load is detected by a nozzle and balanced by modulating the air pressure in an opposing capsule. { nù 'mad·ik 'wā·iŋ ˌsis·təm }

pn hook transistor *See* hook collector transistor. { ˌpēˌen 'hůk tranˌzis·tər }

pnip transistor [ELECTR] An intrinsic junction transistor in which the intrinsic region is sandwiched between the *n*-type base and the *p*-type collector. { ˌpēˌen,ˌpē tranˌzis·tər }

pn junction [ELECTR] The interface between two regions in a semiconductor crystal which have been treated so that one is a *p*-type semiconductor and the other is an *n*-type semiconductor; it contains a permanent dipole charge layer. { ˌpēˌen ˌjəŋk·shən }

pnpn diode [ELECTR] A semiconductor device consisting of four alternate layers of *p*-type and *n*-type semiconductor material, with terminal connections to the two outer layers. Also known as *npnp* diode. { ˌpēˌenˌpēˌen ˌdīˌōd }

pnpn transistor *See npnp* transistor. { ¦pē¦en¦pē¦en tran,zis·tər }

pnp transistor [ELECTR] A junction transistor having an *n*-type base between a *p*-type emitter and a *p*-type collector. { ¦pē¦en¦pē tran,zis·tər }

pocket [BUILD] A recess in a wall designed to receive a folding or sliding door in the open position. [CIV ENG] A recess made in masonry to receive the end of a beam. { 'päk·ət }

pod [DES ENG] **1.** The socket for a bit in a brace. **2.** A straight groove in the barrel of a pod auger. { päd }

Podbielniak extractor [CHEM ENG] A solvent-extraction device in which centrifugal action enhances liquid-liquid contact and increases resultant separation efficiency. { päd'bēl·nē,ak ik,strak·tər }

Pohlé air lift pump [MECH ENG] A pistonless pump in which compressed air fills the annular space surrounding the uptake pipe and is free to enter the rising column at all points of its periphery. { pō'lā 'er ,lift ,pəmp }

poidometer [ENG] An automatic weighing device for use on belt conveyors. { pȯi'däm·əd·ər }

Poincaré surface of section [MECH] A method of displaying the character of a particular trajectory without examining its complete time development, in which the trajectory is sampled periodically, and the rate of change of a quantity under study is plotted against the value of that quantity at the beginning of each period. Also known as surface of section. { ,pwän,kä'rā 'sər·fəs əv 'sek·shən }

Poinsot ellipsoid *See* inertia ellipsoid. { pwän'sō ə'lip,sȯid }

Poinsot motion [MECH] The motion of a rigid body with a point fixed in space and with zero torque or moment acting on the body about the fixed point. { pwän'sō ,mō·shən }

Poinsot's central axis [MECH] A line through a rigid body which is parallel to the vector sum **F** of a system of forces acting on the body, and which is located so that the system of forces is equivalent to the force **F** applied anywhere along the line, plus a couple whose torque is equal to the component of the total torque **T** exerted by the system in the direction **F**. { ¦pwän·sōz ¦sen·trəl 'ak·səs }

Poinsot's method [MECH] A method of describing Poinsot motion, by means of a geometrical construction in which the inertia ellipsoid rolls on the invariable plane without slipping. { pwän'sōz ¦meth·əd }

point angle [DES ENG] The angle at the point or edge of a cutting tool. { 'pȯint ,aŋ·gəl }

point-bearing pile *See* end-bearing pile. { 'pȯint ¦ber·iŋ ,pīl }

point-blank range [MECH] Distance to a target that is so short that the trajectory of a bullet or projectile is practically a straight, rather than a curved, line. { 'pȯint¦blaŋk 'rānj }

point contact [ELECTR] A contact between a specially prepared semiconductor surface and a metal point, usually maintained by mechanical pressure but sometimes welded or bonded. { 'pȯint 'kän,takt }

point-contact diode [ELECTR] A semiconductor rectifier that uses the barrier formed between a specially prepared semiconductor surface and a metal point to produce the rectifying action. { 'pȯint ¦kän,takt ,dī,ōd }

point-contact transistor [ELECTR] A transistor having a base electrode and two or more point contacts located near each other on the surface of an *n*-type semiconductor. { 'pȯint ¦kän,takt tran,zis·tər }

pointer [ENG] The needle-shaped rod that moves over the scale of a meter. { 'pȯint·ər }

pointing [CIV ENG] **1.** Finishing a mortar joint. **2.** Pressing mortar into a raked joint. { 'pȯint·iŋ }

pointing trowel [ENG] A tool used to apply pointing to the joints between bricks. { 'pȯint·iŋ ,traůl }

point initiation [ENG] Application of the initial impulse from the detonator to a single point on the main charge surface; for a cylindrical charge this point is usually the center of one face. { 'pȯint i,nish·ē'ā·shən }

point-junction transistor [ELECTR] Transistor having a base electrode and both point-contact and junction electrodes. { 'pȯint ,jəŋk·shən tran,zis·tər }

point of contraflexure [MECH] A point at which the direction of bending changes. Also known as point of inflection. { 'pȯint əv ,kän·trə'flek·shər }

point of control [IND ENG] Fraction defective in those lots that have a probability of .50 of acceptance according to a specific sampling acceptance plan. { 'pȯint əv kən'trōl }

point of fall [MECH] The point in the curved path of a falling projectile that is level with the muzzle of the gun. Also known as level point. { 'pȯint əv 'fȯl }

point of frog [CIV ENG] The place of intersection of the gage lines of the main track and a turnout. { 'pȯint əv 'frȯg }

point of inflection *See* point of contraflexure. { 'pȯint əv in'flek·shən }

point of intersection [CIV ENG] The point at which two straight sections or tangents to a road curve or rail curve meet when extended. { 'pȯint əv ,in·tər'sek·shən }

point of switch [CIV ENG] That place in a track where a car passes from the main track to a turnout. { 'pȯint əv 'swich }

point of tangency [CIV ENG] The point at which a road curve or railway curve becomes straight or changes its curvature. Also known as tangent point. { 'pȯint əv 'tan·jən·sē }

point source [CIV ENG] A municipal or industrial wastewater discharge through a discrete pipe or channel. { 'pȯint ,sȯrs }

point system [IND ENG] **1.** A system of job evaluation wherein job requirements are rated according to a scale of point values. **2.** A wage incentive plan based on points instead of man-minutes. { 'pȯint ,sis·təm }

point-to-point programming [CONT SYS] A method of programming a robot in which each major change in the robot's path of motion is recorded and stored for later use. { ¦pȯint tə ¦pȯint 'prō,gram·iŋ }

poison [ELECTR] A material which reduces the emission of electrons from the surface of a cathode. { 'pȯiz·ən }

Poisson bracket [MECH] For any two dynamical variables, X and Y, the sum, over all degrees of freedom of the system, of $(\partial X/\partial q)(\partial Y/\partial p) - (\partial X/\partial p)(\partial Y/\partial q)$, where q is a generalized coordinate and p is the corresponding generalized momentum. { pwä'sōn ˌbrak·ət }

Poisson number [MECH] The reciprocal of the Poisson ratio. { pwä'sōn ˌnəm·bər }

Poisson ratio [MECH] The ratio of the transverse contracting strain to the elongation strain when a rod is stretched by forces which are applied at its ends and which are parallel to the rod's axis. { pwä'sōn ˌrā·shō }

polarity effect [ELECTR] An effect for which the breakdown voltage across a vacuum separating two electrodes, one of which is pointed, is much higher when the pointed electrode is the anode. { pə'lar·əd·ē i,fekt }

polarizability [ELEC] The electric dipole moment induced in a system, such as an atom or molecule, by an electric field of unit strength. { ˌpō·lə,rīz·ə'bil·əd·ē }

polarization [ELEC] **1.** The process of producing a relative displacement of positive and negative bound charges in a body by applying an electric field. **2.** A vector quantity equal to the electric dipole moment per unit volume of a material. Also known as dielectric polarization; electric polarization. **3.** A chemical change occurring in dry cells during use, increasing the internal resistance of the cell and shortening its useful life. { ˌpō·lə·rə'zā·shən }

polarization charge *See* bound charge. { ˌpō·lə·rə'zā·shən ˌchärj }

polarized meter [ENG] A meter having a zero-center scale, with the direction of deflection of the pointer depending on the polarity of the voltage or the direction of the current being measured. { 'pō·lə,rīzd 'mēd·ər }

polarized-vane ammeter [ENG] An ammeter of only moderate accuracy in which the current to be measured passes through a small coil, distorting the field of a circular permanent magnet, and an iron vane aligns itself with the axis of the distorted field, the deflection being roughly proportional to the current. { 'pō·lə,rīzd ˌvān 'am,ēd·ər }

polarizing pyrometer [ENG] A type of pyrometer, such as the Wanner optical pyrometer, in which monochromatic light from the source under investigation and light from a lamp with filament maintained at a constant but unknown temperature are both polarized and their intensities compared. { 'pō·lə,rīz·iŋ pī'räm·əd·ər }

polar radiation pattern [ENG ACOUS] Diagram showing the strength of sound waves radiated from a loudspeaker in various directions in a given plane, or a similar response pattern for a microphone. { 'pō·lər ˌrād·ē'ā·shən ˌpad·ərn }

polar timing diagram [MECH ENG] A diagram of the events of an engine cycle relative to crankshaft position. { 'pō·lər 'tīm·iŋ ˌdī·ə,gram }

polder [CIV ENG] Land reclaimed from the sea or other body of water by the construction of an embankment to restrain the water. { 'pōl·dər }

pole [ELEC] **1.** One of the electrodes in an electric cell. **2.** An output terminal on a switch; a double-pole switch has two output terminals. [MECH] **1.** A point at which an axis of rotation or of symmetry passes through the surface of a body. **2.** *See* perch. { pōl }

pole-dipole array [ENG] An electrode array used in a lateral search conducted during a resistivity or induced polarization survey, or in drill hole logging, in which one current electrode is placed at infinity while another current electrode and two potential electrodes in proximity are moved across the structure to be investigated. { 'pōl 'dī,pōl ə,rā }

pole lathe [MECH ENG] A simple lathe in which the work is rotated by a cord attached to a treadle. { 'pōl ˌlāth }

pole-pole array [ENG] An electrode array, used in lateral search or in logging, in which one current electrode and the other potential electrode are kept in proximity and traversed across the structure. { 'pōl 'pōl ə,rā }

pole-positioning [CONT SYS] A design technique used in linear control theory in which many or all of a system's closed-loop poles are positioned as required, by proper choice of a linear state feedback law; if the system is controllable, all of the closed-loop poles can be arbitrarily positioned by this technique. { 'pōl pə,zish·ən·iŋ }

polestar recorder [ENG] An instrument used to determine approximately the amount of cloudiness during the dark hours; consists of a fixed long-focus camera positioned so that Polaris is permanently within its field of view; the apparent motion of the star appears as a circular arc on the photograph and is interrupted as clouds come between the star and the camera. { 'pōl,stär ri,kȯrd·ər }

pole-zero configuration [CONT SYS] A plot of the poles and zeros of a transfer function in the complex plane; used to study the stability of a system, its natural motion, its frequency response, and its transient response. { 'pōl ¦zir·ō kən,fig·yə'rā·shən }

polhode [MECH] For a rotating rigid body not subject to external torque, the closed curve traced out on the inertia ellipsoid by the intersection with this ellipsoid of an axis parallel to the angular velocity vector and through the center. { 'pä,lōd }

polhode cone *See* body cone. { 'pä,lōd ˌkōn }

poling [ELEC] Adjustment of polarity; specifically, in wire-line practice, the use of transpositions between transposition sections of open wire or between lengths of cable, to cause the residual cross-talk couplings in individual

sections or lengths to oppose one another. { 'pōl·iŋ }

poling board [CIV ENG] A timber plank driven into soft soil to support the sides of an excavation. { 'pōl·iŋ ˌbȯrd }

polishing [CHEM ENG] In petroleum refining, removal of final traces of impurities, as for a lubricant, by clay adsorption or mild hydrogen treating. [MECH ENG] Smoothing and brightening a surface such as a metal or a rock through the use of abrasive materials. { 'päl·ish·iŋ }

polishing roll [MECH ENG] A roll or series of rolls on a plastics mold; has highly polished chrome-plated surfaces; used to produce a smooth surface on a plastic sheet as it is extruded. { 'päl·ish·iŋ ˌrōl }

polishing wheel [DES ENG] An abrasive wheel used for polishing. { 'päl·ish·iŋ ˌwēl }

polyforming [CHEM ENG] A noncatalytic, petroleum-refinery process charging C_3 and C_4 gases with naphtha or gas oil at high temperature to produce high-quality gasoline and fuel oil; mostly replaced by catalytic reforming; the product is known as polyformdistillate. { 'päl·ēˌfȯrm·iŋ }

polygraph *See* lie detector. { 'päl·iˌgraf }

polyimide [CHEM ENG] A group of polymers that contain a repeating imide group (—CONHCO—). Aromatic polyimides are noted for their resistance to high temperatures, wear, and corrosion. { ˌpäl·ēˈīˌmīd }

polyliner [ENG] A perforated sleeve with longitudinal ribs that is used inside the cylinder of an injection-molding machine. { 'päl·iˌlīn·ər }

polyphase [ELEC] Having or utilizing two or more phases of an alternating-current power line. { 'päl·iˌfāz }

polyphase circuit [ELEC] Group of alternating-current circuits (usually interconnected) which enter (or leave) a delimited region at more than two points of entry; they are intended to be so energized that, in the steady state, the alternating currents through the points of entry, and the alternating potential differences between them, all have exactly equal periods, but have differences in phase, and may have differences in waveform. { 'päl·iˌfāz 'sər·kət }

polyphase meter [ENG] An instrument which measures some electrical quantity, such as power factor or power, in a polyphase circuit. { 'päl·iˌfāz 'mēd·ər }

polyphase wattmeter [ENG] An instrument that measures electric power in a polyphase circuit. { 'päl·iˌfāz 'wätˌmēd·ər }

polysulfide treating [CHEM ENG] A petroleum-refinery process used to remove elemental sulfur from refinery liquids by contacting them with a nonregenerable solution of sodium polysulfide. { ˌpäl·iˈsəlˌfīd 'trēd·iŋ }

polytropic process [THERMO] An expansion or compression of a gas in which the quantity pV^n is held constant, where p and V are the pressure and volume of the gas, and n is some constant. { ˌpäl·iˌträp·ik 'prä·səs }

PONA analysis [ENG] American Society for Testing and Materials analysis of paraffins (P), olefins (O), naphthenes (N), and aromatics (A) in gasolines. { 'pō·nə *or* ˌpēˌōˌenˈā aˌnal·ə·səs }

Ponchon-Savarit method [CHEM ENG] Graphical solution on an enthalpy-concentration diagram of liquid-vapor equilibrium values between trays of a distillation column. { ˌpȯn ˌshȯn ˌsav·ə'rē ˌmeth·əd }

pond *See* gram-force. { pänd }

ponding [BUILD] An accumulation of water on a flat roof because of clogged or inadequate drains. [CIV ENG] **1.** The impoundment of stream water to form a pond. **2.** Covering the surface of newly poured concrete with a thin layer of water to promote curing. { 'pänd·iŋ }

pontoon bridge [CIV ENG] A fixed floating bridge supported by pontoons. { pänˌj'tün ˈbrij }

pontoon-tank roof [ENG] A type of floating tank roof, supported by buoyant floats on the liquid surface of a tank; the roof rises and falls with the liquid level in the tank; used to minimize vapor space above the liquid, thus reducing vapor losses during tank filling and emptying. { pänh'tün ˌtaŋk ˌrüf }

pony truss [CIV ENG] A truss too low to permit overhead braces. { 'pō·nē ˌtrəs }

pool [CIV ENG] A body of water contained in a reservoir, by a dam, or by the gates of a lock. { pül }

Poole-Frenkel effect [ELEC] An increase in the electrical conductivity of insulators and semiconductors in strong electric fields. { ˌpül 'freŋ·kəl iˌfekt }

pop action [MECH ENG] The action of a safety valve as it opens under steam pressure when the valve disk is lifted off its seat. { 'päp ˌak·shən }

Popov's stability criterion [CONT SYS] A frequency domain stability test for systems consisting of a linear component described by a transfer function preceded by a nonlinear component characterized by an input-output function), with a unity gain feedback loop surrounding the series connection. { päˈpȯfs stə'bil·əd·ē krīˌtir·ē·ən }

poppet [CIV ENG] One of the timber and steel structures supporting the fore and aft ends of a ship for launching from sliding ways. [DES ENG] A spring-loaded ball engaging a notch; a ball latch. { 'päp·ət }

poppet valve [MECH ENG] A cam-operated or spring-loaded reciprocating-engine mushroom-type valve used for control of admission and exhaust of working fluid; the direction of movement is at right angles to the plane of its seat. { 'päp·ət ˌvalv }

popping pressure [MECH ENG] In compressible fluid service, the inlet pressure at which a safety valve disk opens. { 'päp·iŋ ˌpresh·ər }

population [ELECTR] The set of electronic components on a printed circuit board. { ˌpäpˈyə'lā·shən }

porcupine boiler [MECH ENG] A boiler having dead end tubes projecting from a vertical shell. { 'pȯr·kyəˌpīn ˌbȯil·ər }

pore diameter [DES ENG] The average or effective diameter of the openings in a membrane, screen, or other porous material. { 'pȯr dī,am·əd·ər }

porosimeter [ENG] Laboratory compressed-gas device used for measurement of the porosity of reservoir rocks. { ,pȯr·ə'sim·əd·ər }

porous bearing [DES ENG] A bearing made from sintered metal powder impregnated with oil by a vacuum treatment. { 'pȯr·əs 'ber·iŋ }

porous mold [ENG] A plastic-forming mold made from bonded or fused aggregates (such as powdered metal or coarse pellets) so that the resulting mass contains numerous open interstices through which air or liquids can pass. { 'pȯr·əs 'mōld }

porous wheel [DES ENG] A grinding wheel having a porous structure and a vitrified or resinoid bond. { 'pȯr·əs 'wēl }

port [ELEC] An entrance or exit for a network. [ENG] The side of a ship or airplane on the left of a person facing forward. [ENG ACOUS] An opening in a bass-reflex enclosure for a loudspeaker, designed and positioned to improve bass response. { pȯrt }

portable [ENG] Capable of being easily and conveniently transported. { 'pȯrd·ə·bəl }

portal [ENG] A redundant frame consisting of two uprights connected by a third member at the top. { 'pȯrd·əl }

portal crane [MECH ENG] A jib crane carried on a four-legged portal built to run on rails. { 'pȯrd·əl 'krān }

porthole [DES ENG] The opening or passageway connecting the inside of a bit or core barrel to the outside and through which the circulating medium is discharged. [ENG] A circular opening in the side of a ship or airplane, usually serving as a window and containing one or more panes of glass. { 'port,hōl }

port of entry [CIV ENG] A location for clearance of foreign goods and citizens through a customhouse. { 'pȯrt əv 'en·trē }

positional-error constant [CONT SYS] For a stable unity feedback system, the limit of the transfer function as its argument approaches zero. { pə'zish·ən·əl ¦er·ər ,kän·stənt }

positional servomechanism [CONT SYS] A feedback control system in which the mechanical position (as opposed to velocity) of some object is automatically maintained. { pə'zish·ən·əl ¦sər·vō'mek·ə,niz·əm }

position-analog unit [ENG] A device employed in machining operations to transmit analog information about the positions of machine parts to a servoamplifier which then compares it with input data. { pə'zish·ən ¦an·ə,läg ,yü·nət }

position-contouring system [CONT SYS] A numerical control system that exerts contouring control in two dimensions and position control in a third. { pə'zish·ən 'kän,tůr·iŋ ,sis·təm }

position control [CONT SYS] A type of automatic control in which the input commands are the desired position of a body. { pə'zish·ən kən,trōl }

position indicator [ENG] An electromechanical dead-reckoning computer, either an air-position indicator or a ground-position indicator. { pə'zish·ən ,in·də,kād·ər }

positioning [MECH ENG] A tooling function concerned with manipulating the workpiece in relationship to the working tools. { pə'zish·ən·iŋ }

positioning action [CONT SYS] Automatic control action in which there is a predetermined relation between the value of a controlled variable and the position of a final control element. { pə'zish·ən·iŋ ,ak·shən }

positioning time [MECH ENG] The time required to move a machining tool from one coordinate position to the next. { pə'zish·ən·iŋ ,tīm }

position sensor [ENG] A device for measuring a position and converting this measurement into a form convenient for transmission. Also known as position transducer. { pə'zish·ən ,sen·sər }

position telemetering [ENG] A variation of voltage telemetering in which the system transmits the measurand by positioning a variable resistor or other component in a bridge circuit so as to produce relative magnitudes of electrical quantities or phase relationships. { pə'zish·ən ¦tel·ə'mēd·ə·riŋ }

position transducer *See* position sensor. { pə'zish·ən tranz,dü·sər }

positive [ELEC] Having fewer electrons than normal, and hence having ability to attract electrons. { 'päz·əd·iv }

positive acceleration [MECH] **1.** Accelerating force in an upward sense or direction, such as from bottom to top, or from seat to head. **2.** The acceleration in the direction that this force is applied. { 'päz·əd·iv ak,sel·ə'rā·shən }

positive charge [ELEC] The type of charge which is possessed by protons in ordinary matter, and which may be produced in a glass object by rubbing with silk. { 'päz·əd·iv 'chärj }

positive click adjustment [IND ENG] A means of adjusting dials or push buttons to incorporate audible clicks or their tactile counterparts at predetermined positions in order to provide appropriate motor-sensory feedback to the operator. { ¦päz·əd·iv ¦klik ə'¦jəz·mənt }

positive clutch [MECH ENG] A clutch designed to transmit torque without slip. { 'päz·əd·iv 'kləch }

positive-displacement compressor [MECH ENG] A compressor that confines successive volumes of fluid within a closed space in which the pressure of the fluid is increased as the volume of the closed space is decreased. { 'päz·əd·iv dis¦plās·mənt kəm,pres·ər }

positive-displacement meter [ENG] A fluid quantity meter that separates and captures definite volumes of the flowing stream one after another and passes them downstream, while counting the number of operations. { 'päz·əd·iv dis¦plās·mənt ,mēd·ər }

positive-displacement pump [MECH ENG] A

pump in which a measured quantity of liquid is entrapped in a space, its pressure is raised, and then it is delivered; for example, a reciprocating piston-cylinder or rotary-vane, gear, or lobe mechanism. { 'päz·əd·iv dis¦plās·mənt ˌpəmp }

positive draft [MECH ENG] Pressure in the furnace or gas passages of a steam-generating unit which is greater than atmospheric pressure. { 'päz·əd·iv 'draft }

positive drive belt *See* timing belt. { 'päz·əd·iv 'drīv ˌbelt }

positive electrode *See* anode. { 'päz·əd·iv i'lekˌtrōd }

positive feedback [CONT SYS] Feedback in which a portion of the output of a circuit or device is fed back in phase with the input so as to increase the total amplification. Also known as reaction (British usage); regeneration; regenerative feedback; retroaction (British usage). { 'päz·əd·iv 'fēdˌbak }

positive mold [ENG] A plastics mold designed to trap all of the molding resin when the mold closes. { 'päz·əd·iv 'mōld }

positive motion [MECH ENG] Motion transferred from one machine part to another without slippage. { 'päz·əd·iv 'mō·shən }

positive temperature coefficient [THERMO] The condition wherein the resistance, length, or some other characteristic of a substance increases when temperature increases. { 'päz·əd·iv 'tem·prə·chər ˌkō·iˌfish·ənt }

positive terminal [ELEC] The terminal of a battery or other voltage source toward which electrons flow through the external circuit. { 'päz·əd·iv 'tərm·ən·əl }

positron camera [ENG] An instrument that uses photomultiplier tubes in combination with scintillation counters to detect oppositely directed gamma-ray pairs resulting from the annihilation with electrons of positrons emitted by short-lived radioisotopes used as tracers in the human body. { 'päz·əˌträn ˌkam·rə }

post [CIV ENG] **1.** A vertical support such as a pillar, upright, or fence stake. **2.** A pole used as a boundary marker. { pōst }

post-and-beam construction [BUILD] A type of wall construction using posts instead of studs. { ˌpōst ən 'bēm kənˌstrək·shən }

postauricular hearing aid [ENG ACOUS] A hearing aid that fits behind the ear and has a sound tip attached to plastic tubing that conducts sound through an ear mold to the ear canal. { ˌpōst·ȯˌrik·yə·lər 'hēr·iŋ ˌād }

post brake [MECH ENG] A brake occasionally fitted on a steam winder or haulage, and consisting of two upright posts mounted on either side of the drum that operate on brake paths bolted to the drum cheeks. { 'pōst ˌbrāk }

postcure bonding [ENG] A method of postcuring at elevated temperatures of parts previously subjected to autoclave or press in order to obtain higher heat-resistant properties of the adhesive bond. { 'pōstˌkyůr 'bänd·iŋ }

post drill [ENG] An auger or drill supported by a post. { 'pōstˌdril }

postemphasis *See* deemphasis. { ¦pōst'em·fə·səs }

postequalization *See* deemphasis. { ¦pōst,ē·kwə·lə'zā·shən }

postforming [ENG] Forming, bonding, or shaping of heated, flexible thermoset laminates before the final thermoset reaction has occurred; upon cooling, the formed shape is held. { pōst 'fȯrm·iŋ }

posthole [CIV ENG] A hole bored in the ground to hold a fence post. { 'pōstˌhōl }

postsynchronizing studio *See* ADR studio. { ˌpōstˌsiŋ·krəˌnīz·iŋ 'stüd·ē·ō }

posttensioning [ENG] Compressing of cast concrete beams or other structural members to impart the characteristics of prestressed concrete. { pōs'ten·shən·iŋ }

pot *See* potentiometer; pothole. { pät }

pot die forming [MECH ENG] Forming sheet or plate metal through a hollow die by the application of pressure which causes the workpiece to assume the contour of the die. { 'pät 'dī ˌfȯrm·iŋ }

potential *See* electric potential. { pə'ten·chəl }

potential difference [ELEC] Between any two points, the work which must be done against electric forces to move a unit charge from one point to the other. Abbreviated PD. { pə'ten·chəl ¦dif·rəns }

potential divider *See* voltage divider. { pə'ten·chəl di'vīd·ər }

potential drop [ELEC] The potential difference between two points in an electric circuit. { pə'ten·chəl ¦dräp }

potential energy [MECH] The capacity to do work that a body or system has by virtue of its position or configuration. { pə'ten·chəl 'en·ər·jē }

potential flow analyzer *See* electrolytic tank. { pə'ten·chəl ¦flō 'an·əˌlīz·ər }

potential gradient [ELEC] Difference in the values of the voltage per unit length along a conductor or through a dielectric. { pə'ten·chəl 'grād·ē·ənt }

potential temperature [THERMO] The temperature that would be reached by a compressible fluid if it were adiabatically compressed or expanded to a standard pressure, usually 1 bar. { pə'ten·chəl 'tem·prə·chər }

potential transformer *See* voltage transformer. { pə'ten·chəl tranz'fȯr·mər }

potential transformer phase angle [ELEC] Angle between the primary voltage vector and the secondary voltage vector reversed; this angle is conveniently considered as positive when the reversed, secondary voltage vector leads the primary voltage vector. { pə'ten·chəl tranz'fȯr·mər 'fāz ˌaŋ·gəl }

potentiometer [ELEC] A resistor having a continuously adjusted sliding contact that is generally mounted on a rotating shaft; used chiefly as a voltage divider. Also known as pot (slang). [ENG] A device for the measurement of an electromotive force by comparison with a known potential difference. { pəˌten·chē'äm·əd·ər }

potentiometric controller [CONT SYS] A controller that operates on the null balance principle, in which an error signal is produced by balancing the sensor signal against a set-point voltage in the input circuit; the error signal is amplified for use in keeping the load at a desired temperature or other parameter. { pə¦ten·chē·ə¦me·trik kən'trōl·ər }

potentiostat [ENG] An automatic laboratory instrument that controls the potential of a working electrode to within certain limits during coulometric (electrochemical reaction) titrations. { pə'ten·chē·ə‚stat }

pot furnace [ENG] **1.** A furnace containing several pots in which glass is melted. **2.** A furnace in which the charge is contained in a pot or crucible. { 'pät ‚fər·nəs }

pothole [CIV ENG] A pot-shaped hole in a pavement surface. { 'pät‚hōl }

Potier diagram [ELEC] Vector diagram showing the voltage and current relations in an alternating-current generator. { pō'tyā ‚dī·ə‚gram }

pot life [CHEM ENG] *See* work life. [ENG] The period of time during which paint remains useful after its original package has been opened or after a catalyst or other additive has been incorporated. Also known as spreadable life; usable life. { 'pät ‚līf }

potometer [ENG] A device for measuring transpiration, consisting of a small vessel containing water and sealed so that the only escape of moisture is by transpiration from a leaf, twig, or small plant with its cut end inserted in the water. { pō'täm·əd·ər }

potomology [CIV ENG] The systematic study of the factors affecting river channels to provide the basis for predictions of the effects of proposed engineering works on channel characteristics. { ‚päd·ə'mäl·ə·jē }

pot plunger [ENG] A plunger used to force softened plastic molding material into the closed cavity of a transfer mold. { 'pät ‚plən·jər }

potter's wheel [ENG] A revolving horizontal disk that turns when a treadle is operated; used to shape clay by hand. { 'päd·ərz 'wēl }

potting [ELECTR] Process of filling a complete electronic assembly with a thermosetting compound for resistance to shock and vibration, and for exclusion of moisture and corrosive agents. { 'päd·iŋ }

pound [MECH] **1.** A unit of mass in the English absolute system of units, equal to 0.45359237 kilogram. Abbreviated lb. Also known as avoirdupois pound; pound mass. **2.** A unit of force in the English gravitational system of units, equal to the gravitational force experienced by a pound mass when the acceleration of gravity has its standard value of 9.80665 meters per second per second (approximately 32.1740 ft/s^2) equal to 4.4482216152605 newtons. Abbreviated lb. Also spelled Pound (Lb). Also known as pound force (lbf). **3.** A unit of mass in the troy and apothecaries' systems, equal to 12 troy or apothecaries' ounces, or 5760 grains, or 5760/7000 avoirdupois pound, or 0.3732417216 kilogram. Also known as apothecaries' pound (abbreviated lb ap in the United States or lb apoth in the United Kingdom); troy pound (abbreviated lb t in the United States, or lb tr or lb in the United Kingdom). { paůnd }

poundal [MECH] A unit of force in the British absolute system of units equal to the force which will impart an acceleration of 1 ft/s^2 to a pound mass, or to 0.138254954376 newton. { 'paůnd·əl }

poundal-foot *See* foot-poundal. { 'paůnd·əl 'fůt }

pound-foot *See* foot-pound. { 'paůnd 'fůt }

pound force *See* pound. { 'paůnd 'fôrs }

pound mass *See* pound. { 'paůnd 'mas }

pound per square foot [MECH] A unit of pressure equal to the pressure resulting from a force of 1 pound applied uniformly over an area of 1 square foot. Abbreviated psf. { 'paůnd pər ¦skwer 'fůt }

pound per square inch [MECH] A unit of pressure equal to the pressure resulting from a force of 1 pound applied uniformly over an area of 1 square inch. Abbreviated psi. { 'paůnd pər ¦skwer 'inch }

pounds per square inch absolute [MECH] The absolute, thermodynamic pressure, measured by the number of pounds-force exerted on an area of 1 square inch. Abbreviated $lbf\ in.^{-2}$ abs; psia. { 'paůns pər ¦skwer 'inch 'ab·sə‚lůt }

pounds per square inch differential [ENG] The difference in pressure between two points in a fluid-flow system, measured in pounds per square inch. Abbreviated psid. { 'paůns pər ¦skwer 'inch dif·ə'ren·chəl }

pounds per square inch gage [MECH] The gage pressure, measured by the number of pounds-force exerted on an area of 1 square inch. Abbreviated psig. { 'paůns pər ¦skwer 'inch 'gāj }

pour test [ENG] The chilling of a liquid under specified test conditions to determine the American Society for Testing and Materials (ASTM) pour point. { 'pȯr ‚test }

powder clutch [MECH ENG] A type of electromagnetic disk clutch in which the space between the clutch members is filled with dry, finely divided magnetic particles; application of a magnetic field coalesces the particles, creating friction forces between clutch members. { 'paůd·ər ‚kləch }

powder flowmeter [ENG] A device used to measure the flow rate of a metal powder. { 'paůd·ər 'flō‚mēd·ər }

powder house [CIV ENG] A magazine for the temporary storage of explosives. { 'paůd·ər ‚haůs }

powder keg [ENG] A small metal keg for black blasting powder. { 'paůd·ər ‚keg }

powder-moisture test [ENG] Determination of moisture in a propellant by drying under prescribed conditions; expressed as percentage by weight. { 'paůd·ər ‚mȯis·chər ‚test }

powder molding [ENG] Generic term for plastics-molding techniques to produce objects of varying sizes and shapes by melting polyethylene

powder, usually against the heated inside of a mold. { 'paud·ər ˌmōld·iŋ }

powder train [ENG] **1.** Train, usually of compressed black powder, used to obtain time action in older fuse types. **2.** Train of explosives laid out for destruction by burning. { 'paud·ər ˌtrān }

power-actuated pressure relief valve [MECH ENG] A pressure relief valve connected to and controlled by a device which utilizes a separate energy source. { 'paù·ər ¦ak·chəˌwād·əd 'presh·ər riˌlēf ˌvalv }

power amplifier [ELECTR] The final stage in multistage amplifiers, such as audio amplifiers and radio transmitters, designed to deliver maximum power to the load, rather than maximum voltage gain, for a given percent of distortion. { 'paù·ər ¦am·pləˌfī·ər }

power barker *See* barker. { 'paù·ər ˌbärk·ər }

power brake [MECH ENG] An automotive brake with engine-intake-manifold vacuum used to amplify the atmospheric pressure on a piston operated by movement of the brake pedal. { 'paù·ər ˌbrāk }

power car [MECH ENG] **1.** A railroad car with equipment for furnishing heat and electric power to a train. **2.** A railroad car with controls, which can be operated by itself or as part of a train. { 'paù·ər ˌkär }

power circuit [ELEC] The wires that carry current to electric motors and other devices that use electric power. { 'paù·ər ˌsər·kət }

power component *See* active component. { 'paù·ər kəm,pō·nənt }

power control valve [MECH ENG] A safety relief device operated by a power-driven mechanism rather than by pressure. { 'paù·ər kən'trōl ˌvalv }

power cylinder [CONT SYS] A linear actuator consisting of a piston in a cylinder, driven by pneumatic or hydraulic fluid under high pressure. { 'paù·ər ˌsil·ən·dər }

power dam [CIV ENG] A dam designed to raise the level of a stream to create or concentrate hydrostatic head for power purposes. { 'paù·ər ˌdam }

power diode *See* pin diode. { 'paù·ər ˌdīˌōd }

power drill [MECH ENG] A motor-driven drilling machine. { 'paù·ər ˌdril }

power-driven [MECH ENG] Of a component or piece of equipment, moved, rotated, or operated by electrical or mechanical energy, as in a power-driven fan or power-driven turret. { 'paù·ər ˌdriv·ən }

power factor [ELEC] The ratio of the average (or active) power to the apparent power (root-mean-square voltage times rms current) of an alternating-current circuit. Abbreviated pf. Also known as phase factor. { 'paù·ər ˌfak·tər }

power-factor meter [ENG] A direct-reading instrument for measuring power factor. { 'paù·ər ˌfak·tər ˌmēd·ər }

power-factor regulator [ELEC] Regulator which functions to maintain the power factor of a line or an apparatus at a predetermined value, or to vary it according to a predetermined plan. { 'paù·ər ˌfak·tər ˌreg·yəˌlād·ər }

power frequency [ELEC] The frequency at which electric power is generated and distributed; in most of the United States it is 60 hertz. { 'paù·ər ˌfrē·kwən·sē }

power generator [ELEC] A device for producing electric energy, such as an ordinary electric generator or a magnetohydrodynamic, thermionic, or thermoelectric power generator. { 'paù·ər ˌjen·əˌrād·ər }

power grasp *See* power grip. { 'paù·ər ˌgrasp }

power grip [IND ENG] A basic grasp whereby the fingers are wrapped around an object and the thumb placed against it; used, for example, in certain hammering operations. Also known as power grasp. { 'paù·ər ˌgrip }

power level [ELEC] The ratio of the amount of power being transmitted past any point in an electric system to a reference power value; usually expressed in decibels. { 'paù·ər ˌlev·əl }

power line [ELEC] Two or more wires conducting electric power from one location to another. Also known as electric power line. { 'paù·ər ˌlīn }

power-line carrier [ELEC] The use of transmission lines to transmit speech, metering indications, control impulses, and other signals from one station to another, without interfering with the lines' normal function of transmitting power. { 'paù·ər ˌlīn ˌkar·ē·ər }

power-line filter *See* line filter. { 'paù·ər ˌlīn ˌfil·tər }

power meter *See* electric power meter. { 'paù·ər ˌmēd·ər }

power pack [ELECTR] Unit for converting power from an alternating- or direct-current supply into an alternating- or direct-current power at voltages suitable for supplying an electronic device. { 'paù·ər ˌpak }

power package [MECH ENG] A complete engine and its accessories, designed as a single unit for quick installation or removal. { 'paù·ər ˌpak·ij }

power plant [MECH ENG] Any unit that converts some form of energy into electrical energy, such as a hydroelectric or steam-generating station, a diesel-electric engine in a locomotive, or a nuclear power plant. Also known as electric power plant. { 'paù·ər ˌplant }

power rating [ELEC] The power available at the output terminals of a component or piece of equipment that is operated according to the manufacturer's specifications. { 'paù·ər ˌrād·iŋ }

power rectifier [ELEC] A device which converts alternating current to direct current and operates at high power loads. { 'paù·ər 'rek·təˌfī·ər }

power relay [ELEC] Relay that functions at a predetermined value of power; may be an overpower relay, an underpower relay, or a combination of both. { 'paù·ər 'rēˌlā }

power resistor [ELEC] A resistor used in electric power systems, ranging in size from 5 watts

to many kilowatts, and cooled by air convection, air blast, or water. { 'paù·ər ri,zis·tər }

power saw [MECH ENG] A power-operated woodworking saw, such as a bench or circular saw. { 'paù·ər ˌsó }

power semiconductor [ELECTR] A semiconductor device capable of dissipating appreciable power (generally over 1 watt) in normal operation; may handle currents of thousands of amperes or voltages up into thousands of volts, at frequencies up to 10 kilohertz. { 'paù·ər 'sem·i·kənˌdək·tər }

power shovel [MECH ENG] A power-operated shovel that carries a short boom on which rides a movable dipper stick carrying an open-topped bucket; used to excavate and remove debris. { 'paù·ərˌshəv·əl }

power slips *See* automatic slips. { 'paù·ərˌslips }

power station *See* generating station. { 'paù·ərˌstā·shən }

power steering [MECH ENG] A steering control system for a propelled vehicle in which an auxiliary power source assists the driver by providing the major force required to direct the road wheels. { 'paù·ərˌstir·iŋ }

power stroke [MECH ENG] The stroke in an engine during which pressure is applied to the piston by expanding steam or gases. { 'paù·ərˌstrōk }

power supply circuit [ELEC] An electrical network used to convert alternating current to direct current. { 'paù·ər səˌplī ˌsər·kət }

power switch [ELEC] An electric switch which energizes or deenergizes an electric load; ranges from ordinary wall switches to load-break switches and disconnecting switches in power systems operating at voltages of hundreds of thousands of volts. { 'paù·ərˌswich }

power train [MECH ENG] The part of a vehicle connecting the engine to propeller or driven axle; may include drive shaft, clutch, transmission, and differential gear. Also known as drive train. { 'paù·ərˌtrān }

power transformer [ELEC] An iron-core transformer having a primary winding that is connected to an alternating-current power line and one or more secondary windings that provide different alternating voltage values. { 'paù·ər tranzˌfór·mər }

power transistor [ELECTR] A junction transistor designed to handle high current and power; used chiefly in audio and switching circuits. { 'paù·ər tranˌzis·tər }

power transmission line [ELEC] The facility in an electric power system used to transfer large amounts of power from one location to a distant location; distinguished from a subtransmission or distribution line by higher voltage, greater power capability, and greater length. Also known as electric main; main (both British usages). { 'paù·ər tranz'mish·ənˌlīn }

power transmission tower [ELEC] A rigid steel tower supporting a high-voltage electric power transmission line, having a large enough spacing between conductors, and between conductors and ground, to prevent corona discharge. { 'paù·ər tranz'mish·ənˌtaù·ər }

power winding [ELEC] In a saturable reactor, a winding to which is supplied the power to be controlled; commonly the functions of the output and power windings are accomplished by the same winding, which is then termed the output winding. { 'paù·ərˌwīnd·iŋ }

Poynting effect [MECH] The effect of torsion of a very long cylindrical rod on its length. { 'pòin·tiŋ iˌfekt }

Poynting's law [THERMO] A special case of the Clapeyron equation, in which the fluid is removed as fast as it forms, so that its volume may be ignored. { 'pòint·iŋz ˌlò }

pp junction [ELECTR] A region of transition between two regions having different properties in *p*-type semiconducting material. { ¦pē¦pē ˌjəŋk·shən }

practical entropy *See* virtual entropy. { 'prak·ti·kəl 'en·trə·pē }

Prandtl number [THERMO] A dimensionless number used in the study of forced and free convection, equal to the dynamic viscosity times the specific heat at constant pressure divided by the thermal conductivity. Symbolized N_{Pr}. { 'pränt·əl ˌnəm·bər }

Pratt truss [CIV ENG] A truss having both vertical and diagonal members between the upper and lower chords, with the diagonals sloped toward the center. { 'prat ˌtrəs }

preamplifier [ELECTR] An amplifier whose primary function is boosting the output of a low-level audio-frequency, radio-frequency, or microwave source to an intermediate level so that the signal may be further processed without appreciable degradation of the signal-to-noise ratio of the system. Also known as preliminary amplifier. { prē'am·pləˌfī·ər }

preassembled [ENG] Assembled beforehand. { ¦prē·ə'sem·bəld }

prebreaker [MECH ENG] Device used to break down large masses of solids prior to feeding them to a crushing or grinding device. { 'prē ¦brāk·ər }

precedence diagram method [IND ENG] A technique for constructing a network in which the activities are represented by symbols that are connected by lines to indicate the logical relationships between them. Abbreviated PDM. { ¦pres·əd·əns 'dī·əˌgram ˌmeth·əd }

precession [MECH] The angular velocity of the axis of spin of a spinning rigid body, which arises as a result of external torques acting on the body. { prē'sesh·ən }

precessional torque [MECH] A torque which causes a rotating body to precess. { prē¦sesh·ən·əl 'tórk }

prechlorination [CIV ENG] Chlorination of water before filtration. { ¦prēˌklór·ə'nā·shən }

precipitation gage [ENG] Any device that measures the amount of precipitation; principally, a rain gage or snow gage. { prəˌsip·ə'tā·shən ˌgāj }

precipitator *See* electrostatic precipitator. { prə'sip·ə,tād·ər }

precision block *See* gage block. { prə'sizh·ən ˌbläk }

precision depth recorder [ENG] A machine that plots sonar depth soundings on electrosensitive paper; can plot variations in depth over a range of 400 fathoms (730 meters) on a paper 18.85 inches (47.9 centimeters) wide. Abbreviated PDR. Also known as precision graphic recorder (PGR). { prə'sizh·ən 'depth riˌkȯrd·ər }

precision graphic recorder *See* precision depth recorder. { prə'sizh·ən 'graf·ik riˈkȯrd·ər }

precision grinding [MECH ENG] Machine grinding to specified dimensions and low tolerances. { prə'sizh·ən ¦grīnd·iŋ }

precoat filter [ENG] A device designed to filter solid particles from a liquid-solid slurry after a precoat of builtup solid material (filter aid or filtered solid) has been applied to the inner surface of the filter medium. { ¦prē'kōt 'fil·tər }

precoating [ENG] The depositing of an inert material, such as filter aid, onto the filter medium prior to the filtration of suspended solids from a solid-liquid slurry. { ¦prē'kōd·iŋ }

precombustion chamber [MECH ENG] A small chamber before the main combustion space of a turbine or reciprocating engine in which combustion is initiated. { ¦prē·kəm¦bəs·chən ˌchām·bər }

precooler [MECH ENG] A device for reducing the temperature of a working fluid before it is used by a machine. { prē'kül·ər }

preferential shop [IND ENG] An establishment in which preference is given to union members in hiring, layoffs, and dismissals, with the understanding that nonunion workers may be employed without being required to join the union when the union cannot supply workers. { ˌpref·ə'ren·chəl 'shäp }

prefilter [ENG] Filter used to remove gross solid contaminants before the liquid stream enters a separator-filter. { prē'fil·tər }

preform [ENG] **1.** A preshaped fibrous reinforcement. **2.** A compact mass of premixed plastic material that has been prepared for convenient handling and control of uniformity during the mold loading process. [ENG ACOUS] The small slab of record stock material that is loaded into a press to be formed into a disk recording. Also known as biscuit (deprecated usage). { prē'fȯrm }

preheater [MECH ENG] A device for preliminary heating of a material, substance, or fluid that will undergo further use or treatment by heating. { prē'hēd·ər }

preheat roll [ENG] In plastic-extrusion coating, the heated roll between the pressure roll and the unwind roll; used to heat the substrate before it is coated. { 'prēˌhēt ˌrōl }

preignition [MECH ENG] Ignition of the charge in the cylinder of an internal combustion engine before ignition by the spark. { ¦prē·ig'nish·ən }

preimpregnation [ENG] The mixing of a plastic resin with reinforcing material or substrate before molding takes place. { ¦prē·im¸preg'nā·shən }

preloading [ENG] For back-pressure-control gas valves, a weight or spring device to control the gas pressure at which the valve will open or close. { prē'lōd·iŋ }

premix [ENG] In plastics molding, materials in which the resin, reinforcement, extenders, fillers, and so on have been premixed before molding. { 'prēˌmiks }

premix gas burner [ENG] Fuel (gas or oil) burner in which fuel and air are premixed prior to ignition in the combustion chamber. { 'prē ˌmiks 'gas ˌbər·nər }

preplastication [ENG] Premelting of injection-molding powders in a chamber separate from the injection cylinder. { ¦prēˌplas·tə'kā·shən }

prepolymer molding [ENG] A urethane-foam-producing system in which a portion of the polyol is prereacted with the isocyanate to form a liquid prepolymer with a pumpable viscosity; when combined with a second blend containing more polyol, catalyst, or blowing agent, the two components react and a foamed plastic results. { prē'päl·i·mər 'mōld·iŋ }

prepreg [ENG] A reinforced-plastics term for the reinforcing material that contains or is combined with the full complement of resin before the molding operation. { 'prēˌpreg }

preprogrammed robot [CONT SYS] A robot that cannot adapt itself to the task it is carrying out, and must follow a built-in program. Also known as sequence robot. { ¦prē'prōˌgramd 'rōˌbät }

preset guidance [ENG] Guidance in which a predetermined path is set into the guidance mechanism of a craft, drone, or missile and is not altered after launching. { 'prēˌset 'gīd·əns }

preset tool [MECH ENG] A machine tool that is used to set an initial value of a parameter controlling another device. { 'preˌset 'tül }

press [MECH ENG] Any of various machines by which pressure is applied to a workpiece, by which a material is cut or shaped under pressure, by which a substance is compressed, or by which liquid is expressed. { pres }

press bonding [ENG] A method of bonding structures or materials through the application of pressure by a platen press or other tool. { 'pres ˌbänd·iŋ }

pressed loading [ENG] A loading operation in which bulk material, such as an explosive in granular form, is reduced in volume by the application of pressure. { 'prest 'lōd·iŋ }

press fit [ENG] An interference or force fit assembled through the use of a press. Also known as force fit. { 'pres ˌfit }

pressing [ENG ACOUS] A phonograph record produced in a record-molding press from a master or stamper. { 'pres·iŋ }

press polish [ENG] High-sheen finish on plastic sheet stock produced by contact with a smooth metal under heat and pressure. { 'pres ˌpäl·ish }

press slide [MECH ENG] The reciprocating member of a power press on which the punch and upper die are fastened. { 'pres ˌslīd }

pressure [MECH] A type of stress which is exerted uniformly in all directions; its measure is the force exerted per unit area. { 'presh·ər }

pressure altimeter [ENG] A highly refined aneroid barometer that precisely measures the pressure of the air at the altitude an aircraft is flying, and converts the pressure measurement to an indication of height above sea level according to a standard pressure-altitude relationship. Also known as barometric altimeter. { 'presh·ər al 'tim·əd·ər }

pressure angle [MECH ENG] The angle that the line of force makes with a line at right angles to the center line of two gears at the pitch points. { 'presh·ər ˌaŋ·gəl }

pressure bag [ENG] A bag made of rubber, plastic, or other impermeable material that provides a flexible barrier between the pressure medium and the part being bonded. { 'presh·ər ˌbag }

pressure bar [MECH ENG] A bar that holds the edge of a metal sheet during press operations, such as punching, stamping, or forming, and prevents the sheet from buckling or becoming crimped. { 'presh·ər ˌbär }

pressure-base factor [CHEM ENG] Factor used in orifice pressure-drop calculations to allow for conditions where the pressure base used for calculating the orifice factor is not 14.73 pounds per square inch absolute (101.56 megapascals); calculated as $F_{pb} = 14.73$/pressure base (absolute). { 'presh·ər ˌbās ˌfak·tər }

pressure bulb [CIV ENG] The zone in a loaded soil mass bounded by an arbitrarily selected isobar of stress. { 'presh·ər ˌbəlb }

pressure carburetor *See* injection carburetor. { 'presh·ər ˌkär·bəˈrād·ər }

pressure chamber [ENG] A chamber in which an artificial environment is established at low or high pressures to test equipment under simulated conditions of operation. { 'presh·ər ˌchām·bər }

pressure coefficient [THERMO] The ratio of the fractional change in pressure to the change in temperature under specified conditions, usually constant volume. { 'presh·ər ˌkō·iˌfish·ənt }

pressure-containing member [MECH ENG] The part of a pressure-relieving device which is in direct contact with the pressurized medium in the vessel being protected. { 'presh·ər kənˈtān·iŋ ˌmem·bər }

pressure control [ENG] Any device or system able to maintain, raise, or lower the pressure in a vessel or processing system as desired. { 'presh·ər kənˌtrōl }

pressure cooker [ENG] An autoclave designed for high-temperature cooking. { 'presh·ər ˌkůk·ər }

pressure deflection [ENG] In a Bourdon or bellows-type pressure gage, the deflection or movement of the primary sensing element when pressured by the fluid being measured. { 'presh·ər diˌflek·shən }

pressure-drop manometer [ENG] Manometer device (liquid-filled U tube) open at both ends, each end connected by tubing to a different location in a flow system (such as fluid- or gas-carrying pipe) to measure the drop in system pressure between the two points. { 'presh·ər ˈdräp maˈnäm·əd·ər }

pressure dye test [ENG] A leak detection method in which a pressure vessel is filled with liquid dye and is pressurized under water to make possible leakage paths visible. { 'presh·ər 'dī ˌtest }

pressure elements [ENG] Those portions of a pressure-measurement gage which are moved or temporarily deformed by the gas or liquid of the system to which the gage is connected; the amount of movement or deformation is proportional to the pressure and is indicated by the position of a pointer or movable needle. { 'presh·ər ˌel·ə·mənts }

pressure forming [ENG] A plastics thermoforming process using pressure to push the plastic sheet to be formed against the mold surface, as opposed to using vacuum to suck the sheet flat against the mold. { 'presh·ər ˌfȯrm·iŋ }

pressure gage [ENG] An instrument having metallic sensing element (as in a Bourdon pressure gage or aneroid barometer) or a piezoelectric crystal (as in a quartz pressure gage) to measure pressure. { 'presh·ər gāj }

pressure hydrophone [ENG ACOUS] A pressure microphone that responds to waterborne sound waves. { 'presh·ər 'hī·drəˌfōn }

pressure measurement [ENG] Measurement of the internal forces of a process vessel, tank, or piping caused by pressurized gas or liquid; can be for a static or dynamic pressure, in English or metric units, either absolute (total) or gage (absolute minus atmospheric) pressure. { 'presh·ər ˌmezh·ər·mənt }

pressure microphone [ENG ACOUS] A microphone whose output varies with the instantaneous pressure produced by a sound wave acting on a diaphragm; examples are capacitor, carbon, crystal, and dynamic microphones. { 'presh·ər 'mī·krəˌfōn }

pressure pad [ENG] A steel reinforcement in the face of a plastics mold to help the land absorb the closing pressure. [ENG ACOUS] A felt pad mounted on a spring arm, used to hold magnetic tape in close contact with the head on some tape recorders. { 'presh·ər ˌpad }

pressure pillow [ENG] A mechanical-hydraulic snow gage consisting of a circular rubber or metal pillow filled with a solution of antifreeze and water, and containing either a pressure transducer or a riser pipe to record increase in pressure of the snow. { 'presh·ər ˌpil·ō }

pressure plate [MECH ENG] The part of an automobile disk clutch that presses against the flywheel. { 'presh·ər ˌplāt }

pressure-plate anemometer [ENG] An anemometer which measures wind speed in terms of the drag which the wind exerts on a solid body; may be classified according to the means

by which the wind drag is measured. Also known as plate anemometer. { 'presh·ər ¦plāt ˌan·ə'mäm·əd·ər }

pressure process [CHEM ENG] Treatment of timber to prevent decay by forcing a preservative such as creosote and zinc chloride into the cells of the wood. { 'presh·ər ˌprä·səs }

pressure rating [ENG] The operating (allowable) internal pressure of a vessel, tank, or piping used to hold or transport liquids or gases. { 'presh·ər ˌrād·iŋ }

pressure-regulating valve [ENG] A valve that releases or holds process-system pressure (that is, opens or closes) either by preset spring tension or by actuation by a valve controller to assume any desired position between full open and full closed. { 'presh·ər ¦reg·yəˌlād·iŋ ˌvalv }

pressure regulator [ENG] Open-close device used on the vent of a closed, gas-pressured system to maintain the system pressure within a specified range. { 'presh·ər 'reg·yəˌlād·ər }

pressure relief [ENG] A valve or other mechanical device (such as a rupture disk) that eliminates system overpressure by allowing the controlled or emergency escape of liquid or gas from a pressured system. { 'presh·ər riˌlēf }

pressure-relief device [MECH ENG] **1.** In pressure vessels, a device designed to open in a controlled manner to prevent the internal pressure of a component or system from increasing beyond a specified value, that is, a safety valve. **2.** A spring-loaded machine part which will yield, or deflect, when a predetermined force is exceeded. { 'presh·ər riˌlēf diˌvīs }

pressure-relief valve [MECH ENG] A valve which relieves pressure beyond a specified limit and recloses upon return to normal operating conditions. { 'presh·ər riˌlēf ˌvalv }

pressure-retaining member [MECH ENG] That part of a pressure-relieving device loaded by the restrained pressurized fluid. { 'presh·ər riˌtān·iŋ ˌmem·bər }

pressure roll [ENG] In plastics-extrusion coating, the roll that with the chill roll applies pressure to the substrate and the molten extruded web. { 'presh·ər ˌrōl }

pressure seal [ENG] A seal used to make pressure-proof the interface (contacting surfaces) between two parts that have frequent or continual relative rotational or translational motion. { 'presh·ər ˌsēl }

pressure still [CHEM ENG] A continuous-flow, petroleum-refinery still in which heated oil (liquid and vapor) is kept under pressure so that it will crack (decompose into smaller molecules) to produce lower-boiling products (pressure distillate or pressure naphtha). { 'presh·ər ˌstil }

pressure storage [ENG] The storage of a volatile liquid or liquefied gas under pressure to prevent evaporation. { 'presh·ər ˌstȯr·ij }

pressure switch [ELEC] A switch that is actuated by a change in pressure of a gas or liquid. { 'presh·ər ˌswich }

pressure system [ENG] Any system of pipes, vessels, tanks, reactors, and other equipment, or interconnections thereof, operating with an internal pressure greater than atmospheric. { 'presh·ər ˌsis·təm }

pressure tank [CHEM ENG] A pressurized tank into which timber is inserted for impregnation with preservative. [CIV ENG] An airtight water tank in which air is compressed to exert pressure on the water and which is used in connection with a water distribution system. { 'presh·ər ˌtaŋk }

pressure tap [ENG] A small perpendicular hole in the wall of a pressurized, fluid-containing pipe or vessel; used for connection of pressure-sensitive elements for the measurement of static pressures. Also known as piezometer opening; static pressure tap. { 'presh·ər ˌtap }

pressure transducer [ENG] An instrument component that detects a fluid pressure and produces an electrical signal related to the pressure. Also known as electrical pressure transducer. { 'presh·ər tranzˌdü·sər }

pressure-travel curve [MECH] Curve showing pressure plotted against the travel of the projectile within the bore of the weapon. { 'presh·ər ¦trav·əl ˌkərv }

pressure treater [CHEM ENG] Any chemical treating device operated at higher-than-atmospheric pressure, as in the chemical and petroleum industries. { 'presh·ər ˌtrēd·ər }

pressure-tube anemometer [ENG] An anemometer which derives wind speed from measurements of the dynamic wind pressures; wind blowing into a tube develops a pressure greater than the static pressure, while wind blowing across a tube develops a pressure less than the static; this pressure difference, which is proportional to the square of the wind speed, is measured by a suitable manometer. { 'presh·ər ¦tüb ˌan·ə'mäm·əd·ər }

pressure tunnel [CIV ENG] A waterway tunnel under pressure because the hydraulic gradient lies above the tunnel crown. { 'presh·ər ˌtən·əl }

pressure vector [IND ENG] A stress on the human body produced at the interface between the operator and the equipment during the use of hand tools or other equipment, and described in terms of direction and magnitude. { 'presh·ər ˌvek·tər }

pressure vessel [ENG] A metal container, generally cylindrical or spheroid, capable of withstanding bursting pressures. { 'presh·ər ˌves·əl }

pressurization [ENG] **1.** Use of an inert gas or dry air, at several pounds above atmospheric pressure, inside the components of a radar system or in a sealed coaxial line, to prevent corrosion by keeping out moisture, and to minimize high-voltage breakdown at high altitudes. **2.** The act of maintaining normal atmospheric pressure in a chamber subjected to high or low external pressure. { ˌpresh·ə·rə'zā·shən }

pressurize [ENG] To maintain normal atmospheric pressure in a chamber subjected to high or low external pressures. { 'presh·əˌrīz }

pressurized blast furnace [ENG] A blast furnace operated under pressure above the ambient; pressure is obtained by throttling the offgas line, which permits a greater volume of air to be passed through the furnace at a lower velocity, and results in increase in smelting rate. { 'presh·əˌrīzd 'blast ˌfər·nəs }

presswork [ENG] The entire range of bending and drawing operations in the cold forming of sheet metal products. { 'presˌwərk }

prestress [ENG] To apply a force to a structure to condition it to withstand its working load more effectively or with less deflection. { ¦prē'stres }

pretensioning [ENG] Process of precasting concrete beams with tensioned wires embedded in them. Also known as Hoyer method of prestressing. { prē'ten·shən·iŋ }

pretersonics *See* acoustoelectronics. { ¦prēd·ər¦sän·iks }

pretravel [CONT SYS] The distance or angle through which the actuator of a switch moves from the free position to the operating position. { 'prēˌtrav·əl }

preventive maintenance [ENG] A procedure of inspecting, testing, and reconditioning a system at regular intervals according to specific instructions, intended to prevent failures in service or to retard deterioration. { pri'ven·tiv 'mānt·ən·əns }

Prevost's theory [THERMO] A theory according to which a body is constantly exchanging heat with its surroundings, radiating an amount of energy which is independent of its surroundings, and increasing or decreasing its temperature depending on whether it absorbs more radiation than it emits, or vice versa. { 'prā·vōz ˌthē·ə·rē }

Price meter [ENG] The ocean current meter in use in the United States: six conical cups, mounted around a vertical axis, rotate and cause a signal in a set of headphones with each rotation; tail vanes and a heavy weight stabilize the instrument. { 'prīs ˌmēd·ər }

prick punch [DES ENG] A tool that has a sharp conical point ground to an angle of 30–60°C; used to make a slight indentation on a workpiece to locate the intersection of centerlines. { 'prik ˌpənch }

prill [CHEM ENG] To form pellet-sized crystals or agglomerates of material by the action of upward-blowing air on falling hot solution; used in the manufacture of ammonium nitrate and urea fertilizers. { pril }

primary air [MECH ENG] That portion of the combustion air introduced with the fuel in a burner. { 'prīˌmer·ē 'er }

primary breaker [MECH ENG] A machine which takes over the work of size reduction from blasting operations, crushing rock to maximum size of about 2-inch (5-centimeter) diameter; may be a gyratory crusher or jaw breaker. Also known as primary crusher. { 'prīˌmer·ē 'brāk·ər }

primary creep [MECH] The initial high strain-rate region in a material subjected to sustained stress. { 'prīˌmer·ē 'krēp }

primary crusher *See* primary breaker. { 'prīˌmer·ē 'krəsh·ər }

primary detector *See* sensor. { 'prīˌmer·ē di'tek·tər }

primary drilling [ENG] The process of drilling holes in a solid rock ledge in preparation for a blast by means of which the rock is thrown down. { 'prīˌmer·ē 'dril·iŋ }

primary energy [ENG] Energy that exists in a naturally occurring form, such as coal, before being converted into an end-use form. { 'prīˌmer·ē 'en·ər·jē }

primary excavation [ENG] Digging performed in undisturbed soil. { 'prīˌmer·ē ˌeks·kə'vā·shən }

primary instrument [ENG] A measuring instrument that can be calibrated without reference to another instrument. { 'prīˌmer·ē 'in·strə·mənt }

primary measuring element [ENG] The portion of a measuring or sensing device that is in direct contact with the variables being measured (such as temperature, pressure, pH, or velocity). { 'prīˌmer·ē 'mezh·ə·riŋ ˌel·ə·mənt }

primary phase [THERMO] The only crystalline phase capable of existing in equilibrium with a given liquid. { 'prīˌmer·ē 'fāz }

primary phase region [THERMO] On a phase diagram, the locus of all compositions having a common primary phase. { 'prīˌmer·ē 'fāz ˌrē·jən }

primary radar [ENG] Radar in which the incident beam is reflected from the target to form the return signal. Also known as primary surveillance radar (PSR). { 'prīˌmer·ē 'rāˌdär }

primary sewage sludge [CIV ENG] A semiliquid waste resulting from sedimentation with no additional treatment. { 'prīˌmer·ē 'sü·ij ˌsləj }

primary stress [MECH] A normal or shear stress component in a solid material which results from an imposed loading and which is under a condition of equilibrium and is not self-limiting. { 'prīˌmer·ē 'stres }

primary surveillance radar *See* primary radar. { 'prīˌmer·ē sər'vā·ləns ˌrāˌdär }

primary treatment [CIV ENG] Removal of floating solids and suspended solids, both fine and coarse, from raw sewage. { 'prīˌmer·ē 'trēt·mənt }

prime [ENG] **1.** Main or primary, as in prime contractor. **2.** In blasting, to place a detonator in a cartridge or charge of explosive. **3.** To treat wood with a primer or penetrant primer. **4.** To add water to a pump to enable it to begin pumping. { prīm }

prime contractor [ENG] A contractor having a direct contract for an entire project; the contractor may in turn assign portions of the work to subcontractors. { 'prīm 'känˌtrak·tər }

prime mover [MECH ENG] **1.** The component of a power plant that transforms energy from the thermal or the pressure form to the mechanical form. **2.** A tractor or truck, usually with four-wheel drive, used for hauling tasks. { 'prīm 'müv·ər }

primer [ENG] In general, a small, sensitive initial explosive train component which on being actuated initiates functioning of the explosive train, and will not reliably initiate high explosive charge; classified according to the method of initiation, for example, percussion primer, electric primer, or friction primer. { 'prīm·ər }

primer cup [ENG] A small metal cup, into which the primer mixture is loaded. { 'prīm·ər ˌkəp }

primer-detonator [ENG] A unit, in a metal housing, in which are assembled a primer, a detonator, and when indicated, an intervening delay charge. { 'prīm·ər 'det·ənˌād·ər }

primer leak [ENG] Defect in a cartridge which allows partial escape of the hot propelling gases in a primer, caused by faulty construction or an excessive charge. { 'prīm·ər ˌlēk }

priming [MECH ENG] In a boiler, the excessive carryover of fine water particles along with the steam because of insufficient steam space, faulty boiler design, or faulty operating conditions. { 'prīm·iŋ }

priming pump [MECH ENG] A device on motor vehicles and tanks, providing a means of injecting a spray of fuel into the engine to facilitate starting. { 'prīm·iŋ ˌpəmp }

primitive [CONT SYS] A basic operation of a robot, initialized by a single command statement in the program that controls the robot. { 'prim·əd·iv }

principal axis [ENG ACOUS] A reference direction for angular coordinates used in describing the directional characteristics of a transducer; it is usually an axis of structural symmetry or the direction of maximum response. [MECH] One of three perpendicular axes in a rigid body such that the products of inertia about any two of them vanish. { 'prin·sə·pəl 'ak·səs }

principal axis of strain [MECH] One of the three axes of a body that were mutually perpendicular before deformation. Also known as strain axis. { 'prin·sə·pəl 'ak·səs əv 'strān }

principal axis of stress [MECH] One of the three mutually perpendicular axes of a body that are perpendicular to the principal planes of stress. Also known as stress axis. { 'prin·sə·pəl 'ak·səs əv 'stres }

principal function [MECH] The integral of the Lagrangian of a system over time; it is involved in the statement of Hamilton's principle. { 'prin·sə·pəl 'fəŋk·shən }

principal item [ENG] Item which, because of its major importance, requires detailed analysis and examination of all factors affecting its supply and demand, as well as an unusual degree of supervision; its selection is based upon such criteria as strategic importance, high monetary value, unusual complexity of issue, and procurement difficulties. { 'prin·sə·pəl 'ɪd·əm }

principal meridian [CIV ENG] One of the meridians established by the United States government as a reference for subdividing public land. { 'prin·sə·pəl mə'rid·ē·ən }

principal plane of stress [MECH] For a point in an elastic body, a plane at that point across which the shearing stress vanishes. { 'prin·sə·pəl 'plān əv 'stres }

principal strain [MECH] The elongation or compression of one of the principal axes of strain relative to its original length. { 'prin·sə·pəl 'strān }

principal stress [MECH] A stress occurring at right angles to a principal plane of stress. { 'prin·sə·pəl 'stres }

principle of coincidence [ENG] The principle of operation of a vernier, according to which the fraction of the smallest division of the main scale is determined by the division of the vernier which is exactly in line with a division of the main scale. { 'prin·sə·pəl əv kō'in·sə·dəns }

principle of dynamical similarity [MECH] The principle that two physical systems which are geometrically and kinematically similar at a given instant, and physically similar in constitution, will retain this similarity at later corresponding instants if and only if the Froude number 1 for each independent type of force has identical values in the two systems. Also known as similarity principle. { ¦prin·sə·pəl əv diˌnam·ə·kəl ˌsim·ə'lar·əd·ē }

principle of inaccessibility *See* Carathéodory's principle. { 'prin·sə·pəl əv ˌin·akˌses·ə'bil·əd·ē }

principle of least action [MECH] The principle that, for a system whose total mechanical energy is conserved, the trajectory of the system in configuration space is that path which makes the value of the action stationary relative to nearby paths between the same configurations and for which the energy has the same constant value. Also known as least-action principle. { 'prin·sə·pəl əv ˌlēst 'ak·shən }

principle of optimality [CONT SYS] A principle which states that for optimal systems, any portion of the optimal state trajectory is optimal between the states it joins. { 'prin·sə·pəl əv ˌäp·tə'mal·əd·ē }

principle of reciprocity *See* reciprocity therorem. { 'prin·sə·pəl əv ˌres·ə'präs·əd·ē }

principle of superposition [ELEC] **1.** The principle that the total electric field at a point due to the combined influence of a distribution of point charges is the vector sum of the electric field intensities which the individual point charges would produce at that point if each acted alone. **2.** The principle that, in a linear electrical network, the voltage or current in any element resulting from several sources acting together is the sum of the voltages or currents resulting from each source acting alone. Also known as superposition theorem. [MECH] The principle that when two or more forces act on a particle at the same time, the resultant force is the vector sum of the two. { 'prin·sə·pəl əv ˌsü·pər·pə 'zish·ən }

principle of virtual work [MECH] The principle that the total work done by all forces acting on a system in static equilibrium is zero for any infinitesimal displacement from equilibrium which is consistent with the constraints of the

system. Also known as virtual work principle. { 'prin·sə·pəl əv 'vər·chə·wəl ˌwərk }

printed circuit [ELECTR] A conductive pattern that may or may not include printed components, formed in a predetermined design on the surface of an insulating base in an accurately repeatable manner. { 'print·əd 'sər·kət }

printed circuit board [ELECTR] A flat board whose front contains slots for integrated circuit chips and connections for a variety of electronic components, and whose back is printed with electrically conductive pathways between the components. Also known as circuit board. { 'print·əd 'sər·kət ˌbȯrd }

printed wiring board [ELECTR] A copper-clad dielectric material with conductors etched on the external or internal layers. { ¦print·əd 'wīr·iŋ ˌbȯrd }

prior-art search [ENG] **1.** A search for prior art which may possibly anticipate an invention which is being considered for patentability. **2.** A similar search but for the purpose of determining what the status of existing technology is before going ahead with new research; it is done to avoid unwittingly retracing new steps taken by other workers in the field. { 'prī·ər ˌärt ˌsərch }

prismatic astrolabe [ENG] A surveying instrument that makes use of a pan of mercury forming an artificial horizon, and a prism mounted in front of a horizontal telescope to determine the exact times at which stars reach a fixed altitude, and thereby to establish an astronomical position. { priz'mad·ik 'as·trəˌlāb }

prismatic compass [ENG] A hand compass used by surveyors which is equipped with a prism that allows the compass to be read while the site is being taken. { priz'mad·ik 'kəm·pəs }

prism joint [MECH ENG] A robotic articulation that has only one degree of freedom, in sliding motion only. { 'priz·əm ˌjȯint }

prism level [ENG] A surveyor's level with prisms that allow the levelman to view the level bubble without moving his eye from the telescope. { 'priz·əm 'lev·əl }

probe [ENG] A small tube containing the sensing element of electronic equipment, which can be lowered into a borehole to obtain measurements and data. { prōb }

probe gas [ENG] Tracer gas emitted from a small orifice for impingement on a restricted area being tested for leaks. { 'prōb ˌgas }

probe-type liquid-level meter [ENG] Device to sense or measure the level of liquids in storage or process vessels by means of an immersed electrode or probe. { 'prōb ˌtīp 'lik·wəd ¦lev·əl ˌmēd·ər }

process [ENG] A system or series of continuous or regularly occurring actions taking place in a predetermined or planned manner to produce a desired result. { 'präˌses }

process analyzer [CHEM ENG] An instrument for determining the chemical composition of the substances involved in a chemical process directly, or for measuring the physical parameters indicative of composition. { 'präˌsəs ˌanˌəˌlīz·ər }

process chart [IND ENG] A graphic representation of events occurring during a series of actions or operations. { 'präˌsəs ˌchärt }

process control [ENG] Manipulation of the conditions of a process to bring about a desired change in the output characteristics of the process. { 'präˌsəs kənˌtrōl }

process control chart [IND ENG] A tabulated graphical arrangement of test results and other pertinent data for each production assembly unit, arranged in chronological sequence for the entire assembly. { 'präˌsəs kənˌtrōl ˌchärt }

process control engineering [ENG] A field of engineering dealing with ways and means by which conditions of continuous processes are automatically kept as close as possible to desired values or within a required range. { 'präˌsəs kənˌtrōl ˌen·jəˌnir·iŋ }

process control system [CONT SYS] The automatic control of a continuous operation. { 'präˌsəs kənˌtrōl ˌsis·təm }

process dynamics [ENG] The dynamic response interrelationships between components (units) of a complex system, such as in a chemical process plant. { 'präˌsəs dīˌnam·iks }

process engineering [ENG] A service function of production engineering that involves selection of the processes to be used, determination of the sequence of all operations, and requisition of special tools to make a product. { 'präˌsəs ˌen·jəˌnir·iŋ }

process furnace [CHEM ENG] Furnace used to heat process-stream materials (liquids, gases, or solids) in a chemical-plant operation; types are direct-fired, indirect-fired, and pebble heaters. { 'präˌsəs ˌfər·nəs }

process heater [CHEM ENG] Equipment for the heating of chemical process streams (gases, liquids, or solids); usually refers to furnaces, in contrast to heat exchangers. { 'präˌsəs ˌhēd·ər }

processing [ENG] The act of converting material from one form into another desired form. { 'präˌses·iŋ }

process layout [IND ENG] In a processing plant, the layout of machines, equipment, and locations which groups the same or similar operations. { 'präˌsəs ˌlāˌaůt }

process monitoring [CHEM ENG] The observation of chemical process variables by means of pressure, temperature, flow, and other types of indicators; usually occurs in a central control room. { 'präˌsəs ˌmän·ə·triŋ }

process piping [ENG] In an industrial facility, pipework whose function is to convey the materials used for the manufacturing processes. { 'präˌses ˌpīp·iŋ }

process planning [IND ENG] Determining the conditions necessary to convert material from one state to another. { 'präˌses ˌplan·iŋ }

process reengineering [SYS ENG] The study, capture, and modification of the internal mechanisms or functionality of an existing process or

systems-engineering life cycle in order to reconstitute it in a new form and with new functional and nonfunctional features, often to take advantage of newly emerged or desired organizational or technological capabilities without changing the inherent purpose of the process that is being reengineered. { ˌprāˈsəs ˌrēˌenˈjəˈnirˈiŋ }

process sequencing [IND ENG] Specification of the appropriate order for the processes required to manufacture a part. { ˈprāˌses ˌsēˈkwənsˈiŋ }

process time [IND ENG] **1.** Time needed for completion of the machine-controlled portion of a work cycle. **2.** Time required for completion of an entire process. { ˈprāˌses ˌtīm }

process variable [CHEM ENG] Any of those varying operational and physical conditions associated with a chemical processing operation, such as temperature, pressure, flowrate, density, pH, viscosity, or chemical composition. { ˈprāˌses ˌverˈēˈəˈbəl }

producer's risk [IND ENG] The probability that in an acceptance sampling plan, material of an acceptable quality level will be rejected. { prəˈdüˈsərz ˈˌrisk }

product [CHEM ENG] *See* discharge liquor. [IND ENG] **1.** An item or goods made by an industrial firm. **2.** The total of such items or goods. { ˈprädˈəkt }

product design [DES ENG] The determination and specification of the parts of a product and their interrelationship so that they become a unified whole. { ˈprädˈəkt diˌzīn }

production [ENG] Output, such as units made in a factory, oil from a well, or chemicals from a processing plant. { prəˈdəkˈshən }

production control [IND ENG] The procedure for planning, routing, scheduling, dispatching, and expediting the flow of materials, parts, subassemblies, and assemblies within a plant, from the raw state to the finished product, in an orderly and efficient manner. { prəˈdəkˈshən kənˌtrōl }

production engineering [IND ENG] The planning and control of the mechanical means of changing the shape, condition, and relationship of materials within industry toward greater effectiveness and value. { prəˈdəkˈshən ˌenˈjəˈnirˈiŋ }

production model [IND ENG] A model in its final mechanical and electrical form of final production design made by production tools, jigs, fixtures, and methods. { prəˈdəkˈshən ˌmädˈəl }

production requirements [IND ENG] The sum of authorized stock levels and pipeline needs less stocks expected to become available, stock on hand, stocks due in, returned stocks, and stocks from salvage, reclamation, rebuild, and other sources. { prəˈdəkˈshən riˌkwīrˈmənts }

production standard *See* standard time. { prəˈdəkˈshən ˌstanˈdərd }

production track [ENG ACOUS] A sound track which is either prerecorded or recorded directly on the set, and which exists in the film at that time when the music breakdown for scoring is about to begin. { prəˈdəkˈshən ˌtrak }

productive time [IND ENG] Time during which useful work is performed in an operation or process. { prəˈdəkˈtiv ˈtīm }

productivity [IND ENG] The ratio of output production to input effort, it is an indicator of the efficiency with which an enterprise converts its resources (inputs) into finished goods or services (outputs). { ˌprōˌdəkˈtivˈədˈē }

product life-cycle [IND ENG] All the phases, from conception and scale-up, through production, growing use, maturity, and obsolescence of a product. { ˈˌprädˈəkt ˈlīfˌsīˈkəl }

product line [IND ENG] **1.** The range of products offered by a firm. **2.** A group of basically similar products, differentiated only by such characteristics as color, style, or size. { ˈprädˈdəkt ˌlīn }

product of inertia [MECH] Relative to two rectangular axes, the sum of the products formed by multiplying the mass (or, sometimes, the area) of each element of a figure by the product of the coordinates corresponding to those axes. { ˈprädˈdəkt əv iˈnərˈshə }

product reengineering [SYS ENG] The study, capture, and modification of the internal mechanisms or functionality of an existing system or product in order to reconstitute it in a new form with new features, often to take advantage of newly emerged technologies without major change to the inherent functionality and purpose of the system. { ˌprädˈəkt ˌrēˌenˈjəˈnirˈiŋ }

product water [CHEM ENG] Fresh water that is produced by a desalination process; Also known as converted water. { ˈprädˌəkt ˌwȯdˈər }

profile die [ENG] A plastics extrusion die used to produce continuous shapes, but not tubes or sheets. { ˈprōˌfīl ˌdī }

profiled keyway [DES ENG] A keyway for a straight key formed by an end-milling cutter. Also known as end-milled keyway. { ˈˌprōˌfīld ˈkēˌwā }

profiling [ENG] Electrical exploration wherein the transmitter and receiver are moved in unison across a structure to obtain a profile of mutual impedance between transmitter and receiver. Also known as lateral search. { ˈprōˌfīlˈiŋ }

profiling machine [MECH ENG] A machine used for milling irregular profiles; the cutting tool is guided by the contour of a model. { ˈprōˌfīlˈiŋ məˌshēn }

profilograph [ENG] An instrument for measuring and recording roughness of the surface over which it travels. { prōˈfīlˈəˌgraf }

profilometer [ENG] An instrument for measuring the roughness of a surface by means of a diamond-pointed tracer arm attached to a coil in an electric field; movement of the arm across the surface induces a current proportional to surface roughness. { ˌprōˈfəˈläməˈdˈər }

profit sharing [IND ENG] Sharing of company profits with the employees. { ˈpräfˈət ˌsherˈiŋ }

program [IND ENG] An undertaking of significant scope that is enduring rather than occurring within a limited time span. { ˈprōˈgrəm *or* ˈprōˌgram }

program control [CONT SYS] A control system

whose set point is automatically varied during definite time intervals in order to make the process variable vary in some prescribed manner. { 'prō·grəm kən,trōl }

program device [CONT SYS] In missile guidance, tha automatic device used to control time and sequence of events of a program. { 'prō·grəm di,vīs }

program evaluation and review technique *See* PERT. { 'prō·grəm i,val·yə'wā·shən ən ri'vyü tek,nēk }

program level [ENG ACOUS] The level of the program signal in an audio system, expressed in volume units. { 'prō·grəm ,lev·əl }

programmable controller [CONT SYS] A control device, normally used in industrial control applications, that employs the hardware architecture of a computer and a relay ladder diagram language. Also known as programmable logic controller. { prō'gram·ə·bəl kən'trōl·ər }

programmable counter [ELECTR] A counter that divides an input frequency by a number which can be programmed into decades of synchronous down counters; these decades, with additional decoding and control logic, give the equivalent of a divide-by-N counter system, where N can be made equal to any number. { prō'gram·ə·bəl 'kaùnt·ər }

programmable decade resistor [ELECTR] A decade box designed so that the value of its resistance can be remotely controlled by programming logic as required for the control of load, time constant, gain, and other parameters of circuits used in automatic test equipment and automatic controls. { prō'gram·ə·bəl 'de,kād ri,zis·tər }

programmable electronic system [SYS ENG] A system based on a computer and connected to sensors or actuators for the purpose of control, protection, or monitoring. { prō'gram·ə·bəl i'lek,trän·ik ,sis·təm }

programmable logic array *See* field-programmable logic array. { prō'gram·ə·bəl ¦läj·ik ə,rā }

programmable logic controller *See* programmable controller. { prō'gram·ə·bəl ¦läj·ik kən,trōl·ər }

programmed logic array [ELECTR] An array of AND/OR logic gates that provides logic functions for a given set of inputs programmed during manufacture and serves as a read-only memory. Abbreviated PLA. { 'prō,gramd ¦läj·ik ə,rā }

programmer [CONT SYS] A device used to control the motion of a missile in accordance with a predetermined plan. { 'prō,gram·ər }

programming [ENG] In a plastics process, extruding a parison whose thickness differs longitudinally in order to equalize wall thickness of the blown container. { 'prō,gram·iŋ }

programming panel [CONT SYS] A device used to edit a program or insert and monitor it in a programmable controller. { 'prō,gram·iŋ ,pan·əl }

programming unit *See* manual control unit. { 'prō,gram·iŋ ,yü·nət }

program scan [CONT SYS] The span of time during which a programmable controller processor executes all the instructions of a given program. { 'prō·grəm ,skan }

progress chart [IND ENG] A graphical representation of the degree of completion of work in progress. { 'präg·rəs ,chärt }

progressive bonding [ENG] A method of curing a resin adhesive wherein heat and pressure are applied in successive steps. Also known as progressive gluing. { prə'gres·iv 'bänd·iŋ }

progressive gluing *See* progressive bonding. { prə¦gres·iv 'glü·iŋ }

project [ENG] A specifically defined task within a research and development field, which is established to meet a single requirement, either stated or anticipated, for research data, an end item of material, a major component, or a technique. { 'prä,jekt }

projected-scale instrument [ENG] An indicating instrument in which a light beam projects an image of the scale on a screen. { prə'jek·təd ¦skāl ,in·strə·mənt }

projected window [BUILD] A window having one or more rotatable sashes which swing either inward or outward. { prə'jek·təd 'win·dō }

project engineering [ENG] **1.** The engineering design and supervision (coordination) aspects of building a manufacturing facility. **2.** The engineering aspects of a specific project, such as development of a product or solution to a problem. { 'prä,jekt en·jə'nir·iŋ }

projection thermography [ENG] A method of measuring surface temperature in which thermal radiation from a surface is imaged by an optical system on a thin screen of luminescent material, and the pattern formed corresponds to the heat radiation of the surface. { prə'jek·shən thər 'mäg·rə·fē }

project life *See* economic life. { 'prä·jikt ,līf }

projector [ENG ACOUS] **1.** A horn designed to project sound chiefly in one direction from a loudspeaker. **2.** An underwater acoustic transmitter. { prə'jek·tər }

pronate [CONT SYS] To orient a robot toward a position in which the back or protected side of a manipulator faces up and is exposed. { 'prō,nāt }

prong *See* pin. { präŋ }

prony brake [MECH ENG] An absorption dynamometer that applies a friction load to the output shaft by means of wood blocks, a flexible band, or other friction surface. { 'prō·nē ,brāk }

proof [ENG] Reproduction of a die impression by means of a cast. { prüf }

proof load [ENG] A predetermined test load, greater than the service load, to which a specimen is subjected before acceptance for use. { 'prüf ,lōd }

proof resilience [MECH] The tensile strength necessary to stretch an elastomer from zero elongation to the breaking point, expressed in foot-pounds per cubic inch of original dimension. { 'prüf ri,zil·yəns }

proof stress [MECH] **1.** The stress that causes a specified amount of permanent deformation in a material. **2.** A specified stress to be applied

to a member or structure in order to assess its ability to support service loads. { 'prüf ˌstres }

propagated blast [ENG] A blast of a number of unprimed charges of explosives plus one hole primed, generally for the purpose of ditching, where each charge is detonated by the explosion of the adjacent one, the shock being transmitted through the wet soil. { 'präp·əˌgād·əd 'blast }

propane deasphalting [CHEM ENG] Petroleum-refinery solvent process using propane to remove and precipitate asphalt from petroleum stocks, such as for lubricating oils. { 'prōˌpān dēˈasˌfȯld·iŋ }

propane decarbonizing [CHEM ENG] Petroleum-refinery solvent process using propane to recover catalytic-cracking feedstock from heavy-fuel residues; when butane or butane-propane solvent is used, the process is called solvent decarbonizing. { 'prōˌpān dēˈkär·bəˌnīz·iŋ }

propane dewaxing [CHEM ENG] Petroleum-refinery solvent process using propane to remove waxes from lubricating oils to lower the lube-oil pour point. { 'prōˌpān dēˈwaks·iŋ }

propane fractionation [CHEM ENG] Continuous, petroleum-refinery solvent process using liquid propane to segregate long-vacuum residue into two or more grades of lube-oil stock (such as heavy neutral stock or bright stock) and asphalt. { 'prōˌpān ˌfrak·shəˈnā·shən }

propellant-actuated device [ENG] A device that employs the energy supplied by the gases produced by burning propellants to accomplish or initiate a mechanical action other than propelling a projectile. { prəˈpel·ənt ˈak·chəˌwād·əd diˌvīs }

propeller [MECH ENG] A bladed device that rotates on a shaft to produce a useful thrust in the direction of the shaft axis. { prəˈpel·ər }

propeller anemometer [ENG] A rotation anemometer which is encased in a strong glass outer shell that protects it against hydrostatic pressure. { prəˈpel·ər ˌan·əˈmäm·əd·ər }

propeller blade [DES ENG] One of two or more plates radiating out from the hub of a propeller and normally twisted to form part of a helical surface. { prəˈpel·ər ˌblād }

propeller boss [DES ENG] The central portion of the screw propeller which carries the blades, and forms the medium of attachment to the propeller shaft. Also known as propeller hub. { prəˈpel·ər ˌbȯs }

propeller efficiency [MECH ENG] The ratio of the thrust horsepower delivered by the propeller to the shaft horsepower as delivered by the engine to the propeller. { prəˈpel·ər iˌfish·ən·sē }

propeller fan [MECH ENG] An axial-flow blower, with or without a casing, using a propeller-type rotor to accelerate the fluid. { prəˈpel·ər ˈfan }

propeller hub *See* propeller boss. { prəˈpel·ər ˌhəb }

propeller meter [ENG] A quantity meter in which the flowing stream rotates a propellerlike device and revolutions are counted. { prəˈpel·ər ˈmēd·ər }

propeller pump *See* axial-flow pump. { prəˈpel·ər ˈpəmp }

propeller shaft [MECH ENG] A shaft, carrying a screw propeller at its end, that transmits power from an engine to the propeller. { prəˈpel·ər ˌshaft }

propeller slip angle [MECH ENG] The angle between the plane of the blade face and its direction of motion. { prəˈpel·ər ˈslip ˌaŋ·gəl }

propeller tip speed [MECH ENG] The speed in feet per minute swept by the propeller tips. { prəˈpel·ər ˈtip ˌspēd }

propeller turbine [MECH ENG] A form of reactive-type hydraulic turbine using an axial-flow propeller rotor. { prəˈpel·ər ˈtər·bən }

propeller windmill [MECH ENG] A windmill that extracts wind power from horizontal air movements to rotate the blades of a propeller. { prəˈpel·ər ˈwinˌmil }

proportional band [CONT SYS] The range of values of the controlled variable that will cause a controller to operate over its full range. { prəˈpȯr·shən·əl 'band }

proportional control [CONT SYS] Control in which the amount of corrective action is proportional to the amount of error; used, for example, in chemical engineering to control pressure, flow rate, or temperature in a process system. { prəˈpȯr·shən·əl kənˈtrōl }

proportional controller [CONT SYS] A controller whose output is proportional to the error signal. { prəˈpȯr·shən·əl kənˈtrōl·ər }

proportional dividers [DES ENG] Dividers with two legs, pointed at both ends, and an adjustable pivot; distances measured by the points at one end can be marked off in proportion by the points at the other end. { prəˈpȯr·shən·əl diˈvīd·ərz }

proportional elastic limit [MECH] The greatest stress intensity for which stress is still proportional to strain. { prəˈpȯr·shən·əl iˈlas·tik ˌlim·ət }

proportional limit [MECH] The greatest stress a material can sustain without departure from linear proportionality of stress and strain. { prəˈpȯr·shən·əl 'lim·ət }

proportional-plus-derivative control [CONT SYS] Control in which the control signal is a linear combination of the error signal and its derivative. { prəˈpȯr·shən·əl ˌpləs dəˈriv·əd·iv kənˌtrōl }

proportional-plus-integral control [CONT SYS] Control in which the control signal is a linear combination of the error signal and its integral. { prəˈpȯr·shən·əl ˌpləs 'int·ə·grəl kənˌtrōl }

proportional-plus-integral-plus-derivative control [CONT SYS] Control in which the control signal is a linear combination of the error signal, its integral, and its derivative. { prəˈpȯr·shən·əl ˌpləs 'int·ə·grəl ˌpləs dəˈriv·əd·iv kənˌtrōl }

proportional-speed control *See* floating control. { prəˈpȯr·shən·əl 'spēd kənˌtrōl }

proportioning probe [ENG] A leak-testing probe capable of changing the air-tracer gas ratio without changing the amount of flow it transmits to the testing device. { prəˈpȯr·shən·iŋ ˌprōb }

proportioning pump *See* metering pump. { prə'pór·shən·iŋ ˌpəmp }

propped cantilever [CIV ENG] A beam having one built-in support and one simple support. { 'präpt 'kant·əlˌē·vər }

proprioceptor [CONT SYS] A device that senses the position of an arm or other computer-controlled articulated mechanism of a robot and provides feedback signals. { ˌprō·prē·ə'sep·tər }

propulsion [MECH] The process of causing a body to move by exerting a force against it. { prə'pəl·shən }

propulsion system [MECH ENG] For a vehicle moving in a fluid medium, such as an airplane or ship, a system that produces a required change in momentum in the vehicle by changing the velocity of the air or water passing through the propulsive device or engine; in the case of a rocket-propelled vehicle operating without a fluid medium, the required momentum change is produced by using up some of the propulsive device's own mass, called the propellant. { prə'pəl·shən ˌsis·təm }

protected thermometer [ENG] A reversing thermometer which is encased in a strong glass outer shell that protects it against hydrostatic pressure. { prə'tek·təd thər'mäm·əd·ər }

protective device *See* electric protective device. { prə'tek·tiv di'vīs }

protective finish [ENG] A coating applied to equipment to protect it from corrosion and wear; many substances, including metals, glass, and ceramics, are used. { prə'tek·tiv 'fin·ish }

protective grounding [ELEC] Grounding of the neutral conductor of a secondary power-distribution system, and of all metal enclosures for conductors, to protect persons from dangerous currents. { prə'tek·tiv 'graůnd·iŋ }

protective relay [ELEC] A relay whose principal function is to protect service from interruption or to prevent or limit damage to apparatus. { prə'tek·tiv 'rēˌlā }

prototype [ENG] A model suitable for use in complete evaluation of form, design, and performance. { 'prōd·əˌtīp }

protractor [ENG] A semicircular instrument used to construct and measure angles formed by intersecting lines of a plane; the midpoint of the diameter of the semicircle is marked and serves as the vertex of angles constructed or measured. { 'prōˌtrak·tər }

proving ring [DES ENG] A ring used for calibrating test machines; the diameter of the ring changes when a force is applied along a diameter. { 'prüv·iŋ ˌriŋ }

proximal [CONT SYS] Located close to the base or pedestal and away from the end effector of a robot. { 'präk·sə·məl }

proximate analysis [CHEM ENG] A technique that separates and identifies categories of compounds in a mixture; reported are moisture and ash content, the extracts of the mixture made with alcohol, petroleum ether, water, hydrochloric acid and resins, starches, reducing sugars, proteins, fats, esters, free acids, and so on; this type of analysis of solid fuels allows a prediction to be made as to how the fuel will behave in a furnace. { 'präk·sə·məṭ ə'nal·ə·səs }

proximity detector [ENG] A sensing device that produces an electrical signal when approached by an object or when approaching an object. { präk'sim·əd·ē diˌtek·tər }

proximity sensor [CONT SYS] Any device that measures short distances within a robotic system. Also known as noncontact sensor. { präk 'sim·əd·ē 'sen·sər }

ps *See* picosecond.

psec *See* picosecond.

psf *See* pound per square foot.

psi *See* pound per square inch.

psia *See* pounds per square inch absolute.

psid *See* pounds per square inch differential.

psig *See* pounds per square inch gage.

PSII *See* plasma-source ion implantation.

psophometer [ENG] An instrument for measuring noise in electric circuits; when connected across a 600-ohm resistance in the circuit under study, the instrument gives a reading that by definition is equal to half of the psophometric electromotive force actually existing in the circuit. { sō'fäm·əd·ər }

psophometric electromotive force [ELECTR] The true noise voltage that exists in a circuit. { ˌsäf·əˌme·trik iˌlek·trəˌmōd·iv 'fȯrs }

psophometric voltage [ELECTR] The noise voltage as actually measured in a circuit under specified conditions. { ˌsäf·əˌme·trik 'vōl·tij }

PSR *See* primary radar.

psychogalvanometer [ENG] An instrument for testing mental reaction by determining how skin resistance changes when a voltage is applied to electrodes in contact with the skin. { ˌsī·kōˌgal·və'näm·əd·ər }

psychointegroammeter *See* lie detector. { ˌsī·kōˌin·tə·grō'amˌēd·ər }

psychomotor performance [IND ENG] The degree of skill demonstrated by an operator in the completion of a task. { ˌsī·kəˌmōd·ər pər'fȯr·məns }

psychomotor task [IND ENG] An aspect of a job that requires the operator to use controlled movements of the body. { 'sī·kəˌmōd·ər ˌtask }

psychosomatograph [ENG] An instrument for recording muscular action currents or physical movements during tests of mental-physical coordination. { ˌsī·kō·sə'mad·əˌgraf }

psychromatic ratio [THERMO] Ratio of the heat-transfer coefficient to the product of the mass-transfer coefficient and humid heat for a gas-vapor system; used in calculation of humidity or saturation relationships. { ˌsī·krə'mad·ik 'rā·shō }

psychrometer [ENG] A device comprising two thermometers, one a dry bulb, the other a wet or wick-covered bulb, used in determining the moisture content or relative humidity of air or other gases. Also known as wet and dry bulb thermometer. { sī'kräm·əd·ər }

psychrometric calculator [ENG] A device for

quickly computing certain psychrometric data, usually the dew point and the relative humidity, from known values of the dry- and wet-bulb temperatures and the atmospheric pressure. { ˌsī·krəˈmeˑtrik ˈkalˑkyəˌlādˑər }

psychrometric chart [THERMO] A graph each point of which represents a specific condition of a gas-vapor system (such as air and water vapor) with regard to temperature (horizontal scale) and absolute humidity (vertical scale); other characteristics of the system, such as relative humidity, wet-bulb temperature, and latent heat of vaporization, are indicated by lines on the chart. { ˌsī·krəˈmeˑtrik ˈchärt }

psychrometric formula [THERMO] The semiempirical relation giving the vapor pressure in terms of the barometer and psychrometer readings. { ˌsī·krəˈmeˑtrik ˈfȯrˑmyəˑlə }

psychrometric tables [THERMO] Tables prepared from the psychrometric formula and used to obtain vapor pressure, relative humidity, and dew point from values of wet-bulb and dry-bulb temperature. { ˌsī·krəˈmeˑtrik ˈtā·bəlz }

psychrometry [ENG] The science and techniques associated with measurements of the water vapor content of the air or other gases. { sīˈkämˑəˑtrē }

pt *See* pint.

p-type conductivity [ELECTR] The conductivity associated with holes in a semiconductor, which are equivalent to positive charges. { ˈpē ˌtīp ˌkänˌdəkˈtivˑədˑē }

p-type crystal rectifier [ELECTR] Crystal rectifier in which forward current flows when the semiconductor is positive with respect to the metal. { ˈpē ˌtīp ˈkristˑəl ˈrekˑtəˌfīˑər }

p-type semiconductor [ELECTR] An extrinsic semiconductor in which the hole density exeeds the conduction electron density. { ˈpē ˌtīp ˈsemˑiˑkənˌdəkˑtər }

p^+-type semiconductor [ELECTR] A *p*-type semiconductor in which the excess mobile hole concentration is very large. { ˈpēˌpləs ˌtīp ˈsemˑiˑkənˌdəkˑtər }

p-type silicon [ELECTR] Silicon to which more impurity atoms of acceptor type (with valence of 3, such as boron) than of donor type (with valence of 5, such as phosphorus) have been added, with the result that the hole density exceeds the conduction electron density. { ˈpē ˌtīp ˈsilˑəˌkän }

public address system *See* sound-reinforcement system. { ˈpəbˑlik əˈdres ˌsisˑtəm }

public area [BUILD] The total nonrentable area of a building, such as public conveniences and rest rooms. { ˈpəbˑlik ˈerˑēˑə }

public utility [IND ENG] A business organization considered by law to be vested with public interest and subject to public regulation. { ˈpəbˑlik yüˈtilˑədˑē }

public works [IND ENG] Government-owned and financed works and improvements for public enjoyment or use. { ˈpəbˑlik ˈwərks }

puddle [ENG] To apply water in order to settle loose dirt. { pədˑəl }

puff [ELEC] *See* picofarad. [MECH ENG] A small explosion within a furnace due to combustion conditions. { pəf }

pug mill [MECH ENG] A machine for mixing and tempering a plastic material by the action of blades revolving in a drum or trough. { ˈpəg ˌmil }

puking [CHEM ENG] In a distillation column, the foaming and rising of liquid so that part of it is driven out of the vessel through the vapor line. { ˈpyükˑiŋ }

puller [MECH ENG] A lever-operated chain or wire-rope hoist for lifting or pulling at any angle, which has a reversible ratchet mechanism in the lever permitting short-stroke operation for both tensioning and relaxing, and which holds the loads with a Weston-type friction brake or a releasable ratchet. Also known as come-along. { ˈpůlˑər }

pulley [DES ENG] A wheel with a flat, round, or grooved rim that rotates on a shaft and carries a flat belt, V-belt, rope, or chain to transmit motion and energy. { ˈpůlˑē }

pulley lathe [MECH ENG] A lathe for turning pulleys. { ˈpůlˑē ˌlāth }

pulley stile [BUILD] The upright part of a window frame which holds the pulley and guides the sash. { ˈpůlˑē ˌstīl }

pulley top [MECH ENG] A top with a long shank used to tap setscrew holes in pulley hubs. { ˈpůlˑē ˌtäp }

pull-in torque [MECH ENG] The largest steady torque with which a motor will attain normal speed after accelerating from a standstill. { ˈpůlˌin ˌtȯrk }

pull-out torque [MECH ENG] Th largest torque under which a motor can operate without sharply losing speed. { ˈpūlˌaůt ˌtȯrk }

pullshovel *See* backhoe. { ˈpůlˌshəvˑəl }

pull strength [MECH] A unit in tensile testing; the bond strength in pounds per square inch. { ˈpůl ˌstreŋkth }

pulp *See* slime. { pəlp }

pulper [MECH ENG] A machine that converts materials to pulp, for example, one that reduces paper waste to pulp. { ˈpəlpˑər }

pulping [ENG] Reducing wood to pulp. { ˈpəlpˑiŋ }

pulp molding [ENG] A plastics-industry process in which a resin-impregnated pulp material is preformed by application of a vacuum, after which it is oven-cured and molded. { ˈpəlp ˌmōldˑiŋ }

pulsating flow [ENG] Irregular fluid flow in a piping system often resulting from the pressure variations of reciprocating compressors or pumps within the system. { ˈpəlˌsādˑiŋ ˈflō }

pulsation dampening [ENG] Device installed in a fluid piping system (gas or liquid) to eliminate or even out the fluid-flow pulsations caused by reciprocating compressors, pumps, and such. { pəlˈsāˑshən ˌdamˑpənˑiŋ }

pulse altimeter [ENG] A device which is used to measure the distance of an aircraft above the ground by sending out radar signals in short

pulses and measuring the time delay between the leading edge of the transmitted pulse and that of the pulse returned from the ground. { 'pəls al'tim·əd·ər }

pulse-amplitude discriminator [ENG] Electronic instrument used to investigate the amplitude distribution of the pulses produced in a nuclear detector. { 'pəls ¦am·plə,tüd di'skrim·ə,nād·ər }

pulse circuit [ELECTR] An active electrical network designed to respond to discrete pulses of current or voltage. { 'pəls ˌsər·kət }

pulse column [CHEM ENG] Continuous-phase process column (such as liquid only or gas only) in which the flow-through is pulsating; used to increase mass-transfer rates, as in a liquid-liquid extraction operation. { 'pəls ˌkäl·əm }

pulse-compression radar [ENG] A radar system in which the transmitted signal is linearly frequency-modulated or otherwise spread out in time to reduce the peak power that must be handled by the transmitter; signal amplitude is kept constant; the receiver uses a linear filter to compress the signal and thereby reconstitute a short pulse for the radar display. { 'pəls kəm,presh·ən 'rā,där }

pulsed-bed sorption [CHEM ENG] Solid-liquid countercurrent adsorption process (such as an ion-exchange process) in which the granulated solids bed and the solution flow alternately, in opposite directions. { 'pəlst ¦bed 'sȯrp·shən }

pulsed fast neutron analysis [ENG] A technique for detecting contraband materials, in which a pulsed beam of high-energy neutrons is scanned up and down in a raster pattern while the object under inspection is conveyed through the beam; characteristic gamma rays emitted by materials in the object are detected in order to analyze and image these materials with the help of time-of-flight measurements. { ¦pəlst ˌfast 'nü,trän ə,nal·əsəs }

pulsed-light ceilometer *See* pulsed-light cloud-height indicator. { 'pəlst 'līt sē'läm·əd·ər }

pulsed-light cloud-height indicator [ENG] An instrument used for the determination of cloud heights; it operates on the principle of pulse radar, employing visible light rather than radio waves. Also known as pulsed-light ceilometer. { 'pəlst 'līt 'klaud ˌhīt 'in·də,kād·ər }

pulse-Doppler radar [ENG] Pulse radar that uses the Doppler effect to obtain information about the velocity of a target. { 'pəls ¦dap·lər 'rā,där }

pulsed oscillator [ELECTR] An oscillator that generates a carrier-frequency pulse or a train of carrier-frequency pulses as the result of self-generated or externally applied pulses. { 'pəlst 'äs·ə,lād·ər }

pulse dot soldering iron [ENG] A soldering iron that provides heat to the tip for a precisely controlled time interval, as required for making a good soldered joint without overheating adjacent parts. { 'pəls ˌdät 'säd·ə·riŋ ˌī·ərn }

pulsed transfer function [CONT SYS] The ratio of the z-transform of the output of a system to the z-transform of the input, when both input and output are trains of pulses. Also known as discrete transfer function; z-transfer function. { 'pəlst 'tranz·fər ˌfaŋk·shən }

pulsed video thermography [ENG] A method of nondestructive testing in which a source of heat is applied to an area of a specimen for a very short time duration, and an infrared detection system reveals anomalously hot or cold regions that then appear close to defects. { 'pəlst 'vid·ē·ō thər'mäg·rə·fē }

pulse generator [ELEC] *See* impulse generator. [ELECTR] A generator that produces repetitive pulses or signal-initiated pulses. { 'pəls ˌjen·ə,rād·ər }

pulse height [ELECTR] The strength or amplitude of a pulse, measured in volts. { 'pəls ˌhīt }

pulse integrator [ELECTR] An RC (resistance-capacitance) circuit which stretches in time duration a pulse applied to it. { 'pəls ˌint·ə,grād·ər }

pulse-modulated radar [ENG] Form of radar in which the radiation consists of a series of discrete pulses. { 'pəls ˌmäj·ə¦lād·əd 'rā,där }

pulse modulator [ELECTR] A device for carrying out the pulse modulation of a radio-frequency carrier signal. { 'pəls ˌmäj·ə,lād·ər }

pulser [CHEM ENG] Device used to create a pulsating fluid flow through a process vessel, such as a liquid-liquid or vapor-liquid extraction tower; used to increase contact and mass transfer rates. [ELECTR] A generator used to produce high-voltage, short-duration pulses, as required by a pulsed microwave oscillator or a radar transmitter. { 'pəl·sər }

pulse radar [ENG] Radar in which the transmitter sends out high-power pulses that are spaced far apart in comparison with the duration of each pulse; the receiver is active for reception of echoes in the interval following each pulse. { 'pəls 'rā,där }

pulse repeater [ELECTR] Device used for receiving pulses from one circuit and transmitting corresponding pulses into another circuit; it may also change the frequencies and waveforms of the pulses and perform other functions. { 'pəls ri,pēd·ər }

pulse repetition frequency *See* pulse repetition rate. { 'pəls ˌrep·ə¦tish·ən ˌfrē·kwən·sē }

pulse repetition rate [ELECTR] The number of times per second that a pulse is transmitted. Abbreviated PRR. Also known as pulse recurrence rate; pulse repetition frequency (PRF). { 'pəls ˌrep·ə¦tish·ən ˌrāt }

pulse scaler [ELECTR] A scaler that produces an output signal when a prescribed number of input pulses has been received. { 'pəls ˌskāl·ər }

pulse shaper [ELECTR] A transducer used for changing one or more characteristics of a pulse, such as a pulse regenerator or pulse stretcher. { 'pəls ˌshāp·ər }

pulse stretcher [ELECTR] A pulse shaper that produces an output pulse whose duration is greater than that of the input pulse and whose

amplitude is proportional to the peak amplitude of the input pulse. { 'pəls ˌstrech·ər }

pulse synthesizer [ELECTR] A circuit used to supply pulses that are missing from a sequence due to interference or other causes. { 'pəls ˌsin·thəˌsīz·ər }

pulse-time-modulated radiosonde [ENG] A radiosonde which transmits the indications of the meteorological sensing elements in the form of pulses spaced in time; the meteorological data are evaluated from the intervals between the pulses. Also known as time-interval radiosonde. { 'pəls ¦tīm ¦mäj·əˌlād·əd 'rād·ēˌō ˌsänd }

pulse tracking system [ENG] Tracking system which uses a high-energy, short-duration pulse radiated toward the target from which the velocity, direction, and range are determined by the characteristics of the reflected pulse. { 'pəls 'trak·iŋ ˌsis·təm }

pulse transformer [ELECTR] A transformer capable of operating over a wide range of frequencies, used to transfer nonsinusoidal pulses without materially changing their waveforms. { 'pəls tranzˌfȯr·mər }

pulse transmitter [ELECTR] A pulse-modulated transmitter whose peak-power-output capabilities are usually large with respect to the average-power-output rating. { 'pəls tranzˌmid·ər }

pulse-width discriminator [ELECTR] Device that measures the pulse length of video signals and passes only those whose time duration falls into some predetermined design tolerance. { 'pəls ¦width di'skrim·əˌnād·ər }

pulsometer [MECH ENG] A simple, lightweight pump in which steam forces water out of one of two chambers alternately. { pəl'säm·əd·ər }

pultrusion [ENG] A process for producing continuous fibers for advanced composites which involves pulling reinforcements through tanks of thermoset resins, a preformer, and then a die, where the product is formed into its final shape. { půl'trü·zhən }

pulverization *See* comminution. { ˌpəl·və·rə'zā·shən }

pulverizer [MECH ENG] Device for breaking down of solid lumps into a fine material by cleavage along crystal faces. { 'pəl·vəˌrīz·ər }

pump [ELECTR] Of a parametric device, the source of alternating-current power which causes the nonlinear reactor to behave as a time-varying reactance. [MECH ENG] A machine that draws a fluid into itself through an entrance port and forces the fluid out through an exhaust port. { pəmp }

pumpability test [ENG] Standard test to ascertain the lowest temperature at which a petroleum fuel oil may be pumped. { ˌpəm·pə'bil·əd·ē ˌtest }

pumparound [CHEM ENG] A system or process vessel that moves liquid out of and back into the vessel at a new location; for example, in a bubble tower, the withdrawing of liquid from a plate or tray, followed by cooling, and returning to another plate to induce condensation of vapors. { 'pəm·pəˌraůnd }

pump bob [MECH ENG] A device such as a crank that converts rotary motion into reciprocating motion. { 'pəmp ˌbäb }

pump-down time [ENG] The length of time required to evacuate a leak-tested vessel. { 'pəmp 'daůn ˌtīm }

pumphouse [CIV ENG] A building in which are housed pumps that supply an irrigation system, a power plant, a factory, a reservoir, a farm, a home, and so on. { 'pəmpˌhaůs }

pumping loss [MECH ENG] Power consumed in purging a cylinder of exhaust gas and sucking in fresh air instead. { 'pəmp·iŋ ˌlȯs }

pumping station [CIV ENG] A building in which two or more pumps operate to supply fluid flowing at adequate pressure to a distribution system. { 'pəmp·iŋ ˌstā·shən }

punch [DES ENG] *See* nail set. [MECH ENG] A tool that forces metal into a die for extrusion or similar operations. { pənch }

punched-plate screen [ENG] Flat, perforated plate with round, square, hexagonal, or elongated openings; used for screening (size classification) of crushed or pulverized solids. { 'pəncht ¦plāt ˌskrēn }

punching [ENG] **1.** A piece removed from a sheet of metal or other material by a punch press. **2.** A method of extrusion, cold heading, hot forging, or stamping in a machine for which mating die sections determine the shape or contour of the work. { 'pənch·iŋ }

punch press [MECH ENG] **1.** A press consisting of a frame in which slides or rams move up and down, of a bed to which the die shoe or bolster plate is attached, and of a source of power to move the slide. Also known as drop press. **2.** Any mechanical press. { 'pənch ˌpres }

punch radius [DES ENG] Theradius on the bottom end of the punch over which the metal sheet is bent in drawing. { 'pənch ˌrād·ē·əs }

puncture-sealing tire [ENG] A tire whose interior surface is coated with a plastic material that is forced into a puncture by high-pressure air inside the tire and subsequently hardens to seal the puncture. { ¦pəŋk·chər ˌsēl·iŋ 'tīr }

pure shear [MECH] A particular example of irrotational strain or flattening in which a body is elongated in one direction and shortened at right angles to it as a consequence of differential displacements on two sets of intersecting planes. { 'pyůr 'shir }

purge meter interlock [MECH ENG] A meter to maintain airflow through a boiler furnace at a specific level for a definite time interval; ensures that the proper air-fuel ratio is achieved prior to ignition. { 'pərj ¦mēd·ər 'in·tərˌläk }

purging [ENG] Replacing the atmosphere in a container by an inert substance to prevent formation of explosive mixtures. { 'pərj·iŋ }

purify [ENG] To remove unwanted constituents from a substance. { 'pyůr·əˌfī }

purlin [BUILD] A horizontal roof beam, perpendicular to the trusses or rafters; supports the

roofing material or the common rafters. { 'pər·lən }

purse seine [ENG] A net that can be dropped by two boats to encircle a school of fish, then pulled together at the bottom and raised, thereby catching the fish. { 'pərs ˌsān }

push-bar conveyor [MECH ENG] A type of chain conveyor in which two endless chains are cross-connected at intervals by push bars which propel the load along a stationary bed or trough of the conveyor. { 'půsh ˌbar kənˌvā·ər }

push bench [MECH ENG] A machine used for drawing tubes of moderately heavy gage by cupping metal sheet and applying pressure to the inside bottom of the cup to force it through a die. { 'půsh ˌbench }

push fit [DES ENG] A hand-tight sliding fit between a shaft and a hole. { 'půsh ˌfit }

push nipple [MECH ENG] A short length of pipe used to connect sections of cast iron boilers. { 'půsh ˌnip·əl }

push-pull sound track [ENG ACOUS] A sound track having two recordings so arranged that the modulation in one is 180° out of phase with that in the other. { 'půsh ¦půl 'saůn ˌtrak }

push rod [MECH ENG] A rod, as in an internal combustion engine, which is actuated by the cam to open and close the valves. { 'půsh ˌräd }

push-up [ENG] Concave bottom contour of a plastic container; allows an even bearing surface on the outer edge and prevents the container from rocking. { 'půshˌəp }

putlog [CIV ENG] A crosspiece in a scaffold or formwork; supports the soffits and is supported by the ledgers. { 'půtˌläg }

putty knife [DES ENG] A knife with a broad flexible blade, used to apply and smooth putty. { 'pəd·ē ˌnīf }

pW *See* picowatt.

pwt *See* pennyweight.

pycnometer [ENG] A container whose volume is precisely known, used to determine the density of a liquid by filling the container with the liquid and then weighing it. Also spelled pyknometer. { pik'näm·əd·ər }

pyknometer *See* pycnometer. { pik'näm·əd·ər }

pylon [CIV ENG] **1.** A massive structure, such as a truncated pyramid, on either side of an entrance. **2.** A tower supporting a wire over a long span. **3.** A tower or other structure marking a route for an airplane. { 'pīˌlän }

pyramidal horn [ENG] Horn whose sides form a pyramid. { ¦pir·əˌmid·əl 'hȯrn }

pyranometer [ENG] An instrument used to measure the combined intensity of incoming direct solar radiation and diffuse sky radiation; compares heating produced by the radiation on blackened metal strips with that produced by an electric current. Also known as solarimeter. { ¦pir·ə'näm·əd·ər }

pyrgeometer [ENG] An instrument for measuring radiation from the surface of the earth into space. { ¦pīr·jē'äm·əd·ər }

pyrheliometer [ENG] An instrument for measuring the total intensity of direct solar radiation received at the earth. { ¦pirˌhē·lē'äm·əd·ər }

pyrogenic distillation [CHEM ENG] A cracking process that runs at high temperatures, high pressures, or both, resulting in greater yields of the light hydrocarbon components of gasoline. { ¦pī·rōˌjen·ik ˌdist·əl'ā·shən }

pyroligneous [CHEM ENG] Referring to a substance obtained by the destructive distillation of wood. { ¦pī·rō'lig·nē·əs }

pyrometer [ENG] Any of a broad class of temperature-measuring devices; they were originally designed to measure high temperatures, but some are now used in any temperature range; includes radiation pyrometers, thermocouples, resistance pyrometers, and thermistors. { pī 'räm·əd·ər }

pyrometry [THERMO] The science and technology of measuring high temperatures. { pī'räm·ə·trē }

pyrostat [ENG] **1.** A sensing device that automatically actuates a warning or extinguishing mechanism in case of fire. **2.** A high-temperature thermostat. { 'pī·rəˌstat }

pyrotechnic pistol [ENG] A single-shot device designed specifically for projecting pyrotechnic signals. { ¦pī·rə¦tek·nik 'pis·təl }

pyrotechnics [ENG] Art and science of preparing and using fireworks. { ¦pī·rə¦tek·niks }

pz *See* pièze.

Q

Q [THERMO] A unit of heat energy, equal to 10^{18} British thermal units, or approximately 1.055×10^{21} joules.

Q meter [ENG] A direct-reading instrument which measures the Q of an electric circuit at radio frequencies by determining the ratio of inductance to resistance, and which has also been developed to measure many other quantities. Also known as quality-factor meter. { 'kyü ˌmēd·ər }

Q multiplier [ELECTR] A filter that gives a sharp response peak or a deep rejection notch at a particular frequency, equivalent to boosting the Q of a tuned circuit at that frequency. { 'kyü 'məl·təˌplī·ər }

Q point *See* quiescent operating point. { 'kyü ˌpȯint }

qr *See* quarter.

qr tr *See* quarter.

Q signal [ELECTR] The quadrature component of the chrominance signal in color television, having a bandwidth of 0 to 0.5 megahertz; it consists of $+0.48(R - Y)$ and $+0.41(B - Y)$, where Y is the luminance signal, R is the red camera signal, and B is the blue camera signal. { 'kyü ˌsig·nəl }

qt *See* quart.

quad [ELEC] A series of four separately insulated conductors, generally twisted together in pairs. [ELECTR] A series-parallel combination of transistors; used to obtain increased reliability through double redundancy, because the failure of one transistor will not disable the entire circuit. [THERMO] A unit of heat energy, equal to 10^{15} British thermal units, or approximately 1.055×10^{18} joules. { kwäd }

quadrangle [CIV ENG] **1.** A four-cornered, four-sided courtyard, usually surrounded by buildings. **2.** The buildings surrounding such a courtyard. **3.** A four-cornered, four-sided building. { 'kwäˌdraŋ·gəl }

quadrant [ENG] **1.** An instrument for measuring altitudes, used, for example, in astronomy, surveying, and gunnery; employs a sight that can be moved through a graduated 90° arc. **2.** A lever that can move through a 90° arc. [MECH ENG] A device for converting horizontal reciprocating motion to vertical reciprocating motion. { 'kwä·drənt }

quadrant angle of fall [MECH] The vertical acute angle at the level point, between the horizontal and the line of fall of a projectile. { 'kwä·drənt 'aŋ·gəl əv 'fȯl }

quadrant electrometer [ENG] An instrument for measuring electric charge by the movement of a vane suspended on a wire between metal quadrants; the charge is introduced on the vane and quadrants in such a way that there is a proportional twist to the wire. { 'kwä·drənt iˌlek'träm·əd·ər }

quadraphonic sound system [ENG ACOUS] A system for reproducing sound by means of four loudspeakers properly situated in the listening room, usually at the four corners of a square, with each loudspeaker being fed its own identifiable segment of the program signal. Also known as four-channel sound system. { ˌkwä·drəˈfän·ik 'saůnd }

quadratic performance index [CONT SYS] A measure of system performance which is, in general, the sum of a quadratic function of the system state at fixed times, and the integral of a quadratic function of the system state and control inputs. { kwä'drad·ik pərˈfor·məns ˌin ˌdeks }

quadricycle [MECH ENG] A four-wheeled human-powered land vehicle, usually propelled by the action of the rider's feet on the pedals. { 'kwäd·rəˌsī·kəl }

quadrilateral *See* quadrangle. { ˌkwä·drə'lad·ə·rəl }

quadruple thread [DES ENG] A multiple thread having four separate helices equally spaced around the circumference of the threaded member; the lead is equal to four times the pitch of the thread. { kwə'drüp·əl 'thred }

qualification test [ENG] A formally defined series of tests by which the functional, environmental, and reliability performance of a component or system may be evaluated in order to satisfy the engineer, contractor, or owner as to its satisfactory design and construction prior to final approval and acceptance. { ˌkwäl·ə·fə'kā·shən ˌtest }

quality analysis [IND ENG] Examination of the quality goals of a product or service. { 'kwäl·əd·ē əˌnal·ə·səs }

quality assurance [IND ENG] A series of

planned or systematic actions required to provide adequate confidence that a product or service will satisfy given needs. { 'kwäl·əd·ē ə'shür·əns }

quality control [IND ENG] The operational techniques and the activities that sustain the quality of a product or service in order to satisfy given requirements. It consists of quality planning, data collection, data analysis, and implementation, and is applicable to all phases of the product life cycle: design, development, manufacturing, delivery and installation, and operation and maintenance. { 'kwäl·əd·ē kən,trōl }

quality-control chart [IND ENG] A control chart used to indicate and control the quality of a product. { 'kwäl·əd·ē kən¦trōl ˌchärt }

quality-factor meter *See* Q meter. { 'kwäl·əd·ē ˌfak·tər ˌmēd·ər }

quantity meter [ENG] A type of fluid meter used to measure volume of flow. { 'kwän·əd·ē ˌmēd·ər }

quantizer [ELECTR] A device that measures the magnitude of a time-varying quantity in multiples of some fixed unit, at a specified instant or specified repetition rate, and delivers a proportional response that is usually in pulse code or digital form. { kwän'tīz·ər }

quantum dot [ELECTR] A quantized electronic structure in which electrons are confined with respect to motion in all three dimensions. { ˌkwänt·əm 'dät }

quantum efficiency [ELECTR] The average number of electrons photoelectrically emitted from a photocathode per incident photon of a given wavelength in a phototube. { 'kwän·təm iˌfish·ən·sē }

quantum electronics [ELECTR] The branch of electronics associated with the various energy states of matter, motions within atoms or groups of atoms, and various phenomena in crystals; examples of practical applications include the atomic hydrogen maser and the cesium atomic-beam resonator. { 'kwän·təm ˌiˌlek'trän·iks }

quantum Hall effect [ELECTR] A phenomenon exhibited by certain semiconductor devices at low temperatures and high magnetic fields, whereby the Hall resistance becomes precisely equal to $(h/e^2)/n$, where h is Planck's constant, e is the electronic charge, and n is either an integer or a rational fraction. Also known as von Klitzing effect. { 'kwän·təm 'hōl iˌfekt }

quantum well [ELECTR] A thin layer of material (typically between 1 and 10 nanometers thick) within which the potential energy of an electron is less than outside the layer, so that the motion of the electron perpendicular to the layer is quantized. { ¦kwän·təm 'wel }

quantum well injection transit-time diode [ELECTR] An active microwave diode that employs resonant tunneling through a gallium arsenide quantum well located between two aluminum gallium arsenide barriers to inject electrons into an undoped gallium arsenide drift region. Abbreviated QWITT diode. { ˌkwän·təm ¦wel ˌiek·shən ¦tranz·it ˌtīm 'dīˌōd }

quantum well infrared photodetector [ELECTR] A detector of infrared radiation composed of numerous alternating layers of controlled thickness of gallium arsenide and aluminum gallium arsenide; the spectral response of the device can be tailored within broad limits by adjusting the aluminum-to-gallium ratio and the thicknesses of the layers during growth. Abbreviated QWIP. { ¦kwänt·əm ˌwel ˌin·frə'red ˌfōd·ō·di'tek·tər }

quantum wire [ELECTR] A strip of conducting material about 10 nanometers or less in width and thickness that displays quantum-mechanical effects such as the Aharanov-Bohm effect and universal conductance fluctuations. { 'kwän·təm 'wīr }

quarantine anchorage [CIV ENG] An area where a vessel anchors when satisfying quarantine regulations. { 'kwär·ən,tēn ˌaŋ·kər·ij }

quarry [ENG] An open or surface working or excavation for the extraction of building stone, ore, coal, gravel, or minerals. { 'kwär·ē }

quarry bar [ENG] A horizontal bar with legs at each end, used to carry machine drills. { 'kwär·ē ˌbär }

quarrying [ENG] The surface exploitation and removal of stone or mineral deposits from the earth's crust. { 'kwär·ē·iŋ }

quarrying machine [MECH ENG] Any machine used to drill holes or cut tunnels in native rock, such as a gang drill or tunneling machine; most commonly, a small locomotive bearing rock-drilling equipment operating on a track. { 'kwär·ē·iŋ məˌshēn }

quarry sap *See* quarry water. { 'kwär·ē ˌsap }

quarry water [ENG] Subsurface water retained in freshly quarried rock. Also known as quarry sap. { 'kwär·ē ˌwȯd·ər }

quart [MECH] Abbreviated qt. **1.** A unit of volume used for measurement of liquid substances in the United States, equal to 2 pints, or 1/4 gallon, or 573/4 cubic inches, or $9.46352946 \times 10^{-4}$ cubic meter. **2.** A unit of volume used for measurement of solid substances in the United States, equal to 2 dry pints, or 1/32 bushel, or 107,521/1600 cubic inches, or approximately 1.10122×10^{-3} cubic meter. **3.** A unit of volume used for measurement of both liquid and solid substances, although mainly the former, in the United Kingdom and Canada, equal to 2 U.K. pints, or 1/4 U.K. gallon, or approximately 1.1365225×10^{-3} cubic meter. { kwȯrt }

quarter [MECH] **1.** A unit of mass in use in the United States, equal to 1/4 short ton, or 500 pounds, or 226.796185 kilograms. **2.** A unit of mass used in troy measure, equal to 1/4 troy hundredweight, or 25 troy pounds, or 9.33104304 kilograms. Abbreviated qr tr. **3.** A unit of mass used in the United Kingdom, equal to 1/4 hundredweight, or 28 pounds, or 12.70058636 kilograms. Abbreviated qr. **4.** A unit of volume used in the United Kingdom for measurement of liquid and solid substances, equal to 8 bushels, or 64 gallons, or approximately 0.29094976 cubic meter. { 'kwȯrd·ər }

quartering machine [MECH ENG] A machine

that bores parallel holes simultaneously in such a way that the center lines of adjacent holes are 90° apart. { 'kwȯrd·ə·riŋ məˌshēn }

quarter-turn drive [MECH ENG] A belt drive connecting pulleys whose axes are at right angles. { 'kwȯrd·ər ˌtərn 'drīv }

quartz crystal [ELECTR] A natural or artificially grown piezoelectric crystal composed of silicon dioxide, from which thin slabs or plates are carefully cut and ground to serve as a crystal plate. { 'kwȯrts ˈkrist·əl }

quartz-crystal filter [ELECTR] A filter which utilizes a quartz crystal; it has a small bandwidth, a high rate of cutoff, and a higher unloaded Q than can be obtained in an ordinary resonator. { 'kwȯrts ˌkrist·əl 'fil·tər }

quartz-crystal resonator [ELECTR] A quartz plate whose natural frequency of vibration is used to control the frequency of an oscillator. Also known as quartz resonator. { 'kwȯrts ˌkrist·əl 'rez·ənˌād·ər }

quartz fiber [ENG] An extremely fine and uniform quartz filament that may be used as a torsion thread or as an indicator in an electroscope or dosimeter. { 'kwȯrts 'fī·bər }

quartz-fiber dosimeter [ENG] A dosimeter in which radiation dose is determined from the deflection of a quartz fiber that is initially charged, repelling it from its metal support, and has its charge reduced by ionizing radiation, causing a proportional reduction in its deflection. { ˈkwȯrts ˈfī·bər dō'sim·əd·ər }

quartz-fiber manometer *See* decrement gage. { ˈkwȯrts ˈfī·bər mə'näm·əd·ər }

quartz horizontal magnetometer [ENG] A type of relative magnetometer used as a geomagnetic field instrument and as an observatory instrument for routine calibration of recording equipment. { 'kwȯrts ˌhär·ə'zänt·əl ˌmag·nə'täm·əd·ər }

quartz oscillator [ELECTR] An oscillator in which the frequency of the output is determined by the natural frequency of vibration of a quartz crystal. { 'kwȯrts 'äs·əˌlād·ər }

quartz plate *See* crystal plate. { 'kwȯrts ˈplāt }

quartz pressure gage [ENG] A pressure gage that uses a highly stable quartz crystal resonator whose frequency changes directly with applied pressure. { 'kwȯrts 'presh·ər ˌgāj }

quartz resonator *See* quartz-crystal resonator. { 'kwȯrts 'rez·ənˌād·ər }

quartz resonator force transducer [ENG] A type of accelerometer which measures the change in the resonant frequency of a small quartz plate with a longitudinal slot, forming a double-ended tuning fork, when a longitudinal force associated with acceleration is applied to the plate. { 'kwȯrts 'rez·ənˌād·ər 'fȯrs tranzˌdü·sər }

quartz thermometer [ENG] A thermometer based on the sensitivity of the resonant frequency of a quartz crystal to changes in temperature. { 'kwȯrts thərˌmäm·əd·ər }

quasi-linear feedback control system [CONT SYS] Feedback control system in which the relationships between the pertinent measures of the system input and output signals are substantially linear despite the existence of nonlinear elements. { ˌkwä·zē 'lin·ē·ər 'fēdˌbak kən'trol ˌsis·təm }

quasi-linear system [CONT SYS] A control system in which the relationships between the input and output signals are substantially linear despite the existence of nonlinear elements. { ˌkwä·zē 'lin·ē·ər 'sis·təm }

quasi-particle detector [ENG] A detector of electromagnetic radiation at wavelengths close to 1 millimeter, based on the tunneling of single electrons (more precisely, quasi-particles) through a tunnel junction consisting of an oxide barrier between two superconductors, with a responsivity of one tunneling electron for each microwave photon absorbed. { ˌkwä·zē ˈpärd·ə·kəl diˌtek·tər }

quasi-static process *See* reversible process. { ˌkwä·zē 'stad·ik 'prä·səs }

quay [CIV ENG] A solid embankment or structure parallel to a waterway; used for loading and unloading ships. { kē }

queen closer [CIV ENG] In masonry work, a brick that has been cut in half along its length and is used at the end of a course. { 'kwēn ˌklōs·ər }

queen post [CIV ENG] Either of two vertical members, one on each side of the apex of a triangular truss. { 'kwēn ˌpōst }

quench bath [ENG] A liquid medium, such as oil, fused salt, or water, into which a material is plunged for heat-treatment purposes. { 'kwench ˌbath }

quenching [ELECTR] **1.** The process of terminating a discharge in a gas-filled radiation-counter tube by inhibiting reignition. **2.** Reduction of the intensity of resonance radiation resulting from deexcitation of atoms, which would otherwise have emitted this radiation, in collisions with electrons or other atoms in a gas. [ENG] Shock cooling by immersing liquid or molten material into a cooling medium (liquid or gas); used in metallurgy, plastics forming, and petroleum refining. [MECH ENG] Rapid removal of excess heat from the combustion chamber of an automotive engine. { 'kwench·iŋ }

quench-tank extrusion [ENG] Plastic-film or metal extrusion that is cooled in a quenching medium. { 'kwench ˌtaŋk ik'strü·zhən }

quench temperature [ENG] The temperature of the medium used for quenching. { 'kwench ˌtem·prə·chər }

queue *See* waiting line. { kyü }

queueing [ENG] The movement of discrete units through channels, such as programs or data arriving at a computer, or movement on a highway of heavy traffic. { 'kyü·iŋ }

quick-change gearbox [MECH ENG] A cluster of gears on a machine tool, the arrangement of which allows for the rapid change of gear ratios. { 'kwik ˈchānj 'girˌbäks }

quickmatch [ENG] Fast-burning fuse made from a cord impregnated with black powder. { 'kwikˌmach }

quick return [MECH ENG] A device used in a

reciprocating machine to make the return stroke faster than the power stroke. { 'kwik ri'tərn }

quiescent [ELECTR] Pertaining to a circuit element which has no input signal, so that it does not perform its active function. [ENG] Pertaining to a body at rest, or inactive, such as an undisturbed liquid in a storage or process vessel. { kwē'es·ənt }

quill [DES ENG] A hollow shaft into which another shaft is inserted in mechanical devices. { kwil }

quill drive [MECH ENG] A drive in which the motor is mounted on a nonrotating hollow shaft surrounding the driving-wheel axle; pins on the armature mesh with spokes on the driving wheels, thereby transmitting motion to the wheels; used on electric locomotives. { 'kwil ˌdrīv }

quill gear [MECH ENG] A gear mounted on a hollow shaft. { 'kwil ˌgir }

quintal *See* metric centner. { 'kwint·əl }

quirk [BUILD] **1.** An indentation separating one element from another, as between moldings. **2.** A V groove in the finish-coat plaster where it abuts the return on a door or window. { kwərk }

quirk bead [BUILD] **1.** A bead with a quirk on one side only, as on the edge of a board. Also known as bead and quirk. **2.** A bead that is flush with the adjoining surface and separated from it by a quirk on each side. Also known as bead and quirk; double-quirked bead; flush bead; recessed bead. **3.** A bead located at a corner with quirks at either side at right angles to each other. Also known as bead and quirk; return bead. **4.** A bead with a quirk on its face. Also known as bead and quirk. { kwərk ˌbēd }

Q unit [THERMO] A unit of energy, used in measuring the heat energy of fuel reserves, equal to 10^{18} British thermal units, or approximately 1.055×10^{21} joules. { 'kyü ˌyü·nət }

quoin [BUILD] One of the members forming an outside corner or exterior angle of a building, and differentiated from the wall by color, texture, size, or projection. { kȯin }

quoin post [CIV ENG] The vertical member at the jointed end of a gate in a navigation lock. { 'kȯin ˌpōst }

qwerty keyboard [ENG] A keyboard containing the standard arrangement of letters so named after the first letters on the top alphabetic row. { 'kwərd·ē kēˌbȯrd }

R

rabbet [ENG] **1.** A groove cut into a part. **2.** A strip applied to a part as, for example, a stop or seal. **3.** A joint formed by fitting one member into a groove, channel, or recess in the face or edge of a second member. { 'rab·ət }

rabbet plane [DES ENG] A plane with the blade extending to the outer edge of one side that is open. { 'rab·ət ˌplān }

rabbling [ENG] Stirring a molten charge, as of metal or ore. { 'rab·liŋ }

race [DES ENG] Either of the concentric pair of steel rings of a ball bearing or roller bearing. [ENG] A channel transporting water to or away from hydraulic machinery, as in a power house. { rās }

rack [CIV ENG] A fixed screen composed of parallel bars placed in a waterway to catch debris. [DES ENG] *See* relay rack. [ENG] A frame for holding or displaying articles. [MECH ENG] A bar containing teeth on one face for meshing with a gear. { rak }

rack and pinion [MECH ENG] A gear arrangement consisting of a toothed bar that meshes with a pinion. { 'rak ən 'pin·yən }

rack-and-pinion steering [MECH ENG] A steering system in which the rotation of pinion gear at the end of the steering column moves a toothed bar (the rack) left or right to transmit steering movements. { ¦rak ən ¦pin·yən 'stir·iŋ }

racking [CIV ENG] Setting back the end of each course of brick or stone from the end of the preceding course. { 'rak·iŋ }

rack railway [CIV ENG] A railway with a rack between the rails which engages a gear on the locomotive; used on steep grades. { 'rak ˌrāl,wā }

radar [ENG] **1.** A system using beamed and reflected radio-frequency energy for detecting and locating objects, measuring distance or altitude, navigating, homing, bombing, and other purposes; in detecting and ranging, the time interval between transmission of the energy and reception of the reflected energy establishes the range of an object in the beam's path. Derived from radio detection and ranging. **2.** *See* radar set. { 'rāˌdär }

radar bombsight [ENG] An airborne radar set used to sight the target, solve the bombing problem, and drop bombs. { 'rāˌdär 'bämˌsīt }

radar command guidance [ENG] A missile guidance system in which radar equipment at the launching site determines the positions of both target and missile continuously, computes the missile course corrections required, and transmits these by radio to the missile as commands. { 'rāˌdär kə'mand ˌgīd·əns }

radar contact [ENG] Recognition and identification of an echo on a radar screen; an aircraft is said to be on radar contact when its radar echo can be seen and identified on a PPI (plan-position indicator) display. { 'rāˌdär ˌkänˌtakt }

radar coverage [ENG] The limits within which objects can be detected by one or more radar stations. { 'rāˌdär ˌkəv·rij }

radar coverage indicator [ENG] Device that shows how far a given aircraft should be tracked by a radar station, and also provides a reference (detection) range for quality control; takes into account aircraft size, altitude, screening angle, site elevation, type radar, antenna radiation pattern, and antenna tilt. { 'rāˌdär ¦kəv·rij ˌin·dəˌkād·ər }

radar dome [ENG] Weatherproof cover for a primary radiating element of a radar or radio device which is transparent to radio-frequency energy, and which permits active operation of the radiating element, including mechanical rotation or other movement as applicable. { 'rāˌdär ˌdōm }

radar gun-layer [ENG] A radar device which tracks a target and aims a gun or guns automatically. { 'rāˌdär 'gən ˌlā·ər }

radar homing [ENG] Homing in which a missile-borne radar locks onto a target and guides the missile to that target. { 'rāˌdär ˌhōm·iŋ }

radar marker [ENG] A fixed facility which continuously emits a radar signal so that a bearing indication appears on a radar display. { 'rāˌdär ˌmär·kər }

radar netting [ENG] The linking of several radars to a single center to provide integrated target information. { 'rāˌdär ˌned·iŋ }

radar netting station [ENG] A center which can receive data from radar tracking stations and exchange these data among other radar tracking stations, thus forming a radar netting system. { 'rāˌdär ¦ned·iŋ ˌstā·shən }

radar picket [ENG] A ship or aircraft equipped with early-warning radar and operating at a distance from the area being protected, to extend the range of radar detection. { 'rāˌdär ˌpik·ət }

radar prediction [ENG] A graphic portrayal of the estimated radar intensity, persistence, and shape of the cultural and natural features of a specific area. { 'rā,där pri'dik·shən }

radar range marker *See* distance marker. { 'rā,där 'rānj ,mär·kər }

radar relay [ENG] **1.** Equipment for relaying the radar video and appropriate synchronizing signal to a remote location. **2.** Process or system by which radar echoes and synchronization data are transmitted from a search radar installation to a receiver at a remote point. { 'rā,där 'rē,lā }

radar scanning [ENG] The process or action of directing a radar beam through a space search pattern for the purpose of locating a target. { 'rā,där ,skan·iŋ }

radarscope overlay [ENG] A transparent overlay placed on a radarscope for comparison and identification of radar returns. { 'rā,där,skōp 'ō·vər,lā }

radar set [ENG] A complete assembly of radar equipment for detecting and ranging, consisting essentially of a transmitter, antenna, receiver, and indicator. Also known as radar. { 'rā,där ,set }

radarsonde [ENG] **1.** An electronic system for automatically measuring and transmitting high-altitude meteorological data from a balloon, kite, or rocket by pulse-modulated radio waves when triggered by a radar signal. **2.** A system in which radar techniques are used to determine the range, elevation, and azimuth of a radar target carried aloft by a radiosonde. { 'rā,där,sänd }

radar station [ENG] The place, position, or location from which, or at which, a radar set transmits or receives signals. { 'rā,där ,stā·shən }

radar surveying [ENG] Surveying in which airborne radar is used to measure accurately the distance between two ground radio beacons positioned along a baseline; this eliminates the need for measuring distance along the baseline in inaccessible or extremely rough terrain. { 'rā ,där sər'vā·iŋ }

radar telescope [ENG] A large radar antenna and associated equipment used for radar astronomy. { 'rā,där 'tel·ə,skōp }

radar theodolite [ENG] A theodolite that uses radar to obtain azimuth, elevation, and slant range to a reflecting target, for surveying or other purposes. { 'rā,där thē'äd·ə,līt }

radar threshold limit [ENG] For a given radar and specified target, the point in space relative to the focal point of the antenna at which initial detection criteria can be satisfied. { 'rā,där 'thresh,hōld ,lim·ət }

radar tracking [ENG] Tracking a moving object by means of radar. { 'rā,där ,trak·iŋ }

radar tracking station [ENG] A radar facility which has the capability of tracking moving targets. { 'rā,där 'trak·iŋ ,stā·shən }

radar triangulation [ENG] A radar system of locating targets, usually aircraft, in which two or more separate radars are employed to measure range only; the target is located by automatic trigonometric solution of the triangle composed of a pair of radars and the target in which all three sides are known. { 'rā,där trī,aŋ·gyə'lā·shən }

radar wind system [ENG] Apparatus in which radar techniques are used to determine the range, elevation, and azimuth of a balloon-borne target, and hence to compute upper-air wind data. { 'rā,där ¦wind ,sis·təm }

radial acceleration *See* centripetal acceleration. { 'rād·ē·əl ak,sel·ə'rā·shən }

radial band pressure [MECH] The pressure which is exerted on the rotating band by the walls of the gun tube, and hence against the projectile wall at the band seat, as a result of the engraving of the band by the gun rifling. { 'rād·ē·əl ¦band ,presh·ər }

radial bearing [MECH ENG] A bearing with rolling contact in which the direction of action of the load transmitted is radial to the axis of the shaft. { 'rād·ē·əl 'ber·iŋ }

radial draw forming [MECH ENG] A metal-forming method in which tangential stretch and radial compression are applied gradually and simultaneously. { 'rād·ē·əl 'drò ,fȯrm·iŋ }

radial drill [MECH ENG] A drilling machine in which the drill spindle can be moved along a horizontal arm which itself can be rotated about a vertical pillar. { 'rād·ē·əl 'dril }

radial drilling [ENG] The drilling of several holes in one plane, all radiating from a common point. { 'rād·ē·əl 'dril·iŋ }

radial engine [MECH ENG] An engine characterized by radially arranged cylinders at equiangular intervals around the crankshaft. { 'rād·ē·əl 'en·jən }

radial-flow [ENG] Having the fluid working substance flowing along the radii of a rotating tank. { 'rād·ē·əl ¦flō }

radial-flow turbine [MECH ENG] A turbine in which the gases flow primarily in a radial direction. { 'rād·ē·əl ¦flō 'tər·bən }

radial force [MECH ENG] In machining, the force acting on the cutting tool in a direction opposite to depth of cut. { 'rād·ē·əl 'fȯrs }

radial gate *See* Tainter gate. { 'rād·ē·əl 'gāt }

radial heat flow [THERMO] Flow of heat between two coaxial cylinders maintained at different temperatures; used to measure thermal conductivities of gases. { 'rād·ē·əl 'hēt ,flō }

radial load [MECH ENG] The load perpendicular to the bearing axis. { 'rād·ē·əl 'lōd }

radial locating [MECH ENG] One of the three locating problems in tooling to maintain the desired relationship between the workpiece, the cutter, and the body of the machine tool; the other two locating problems are concentric and plane locating. { 'rād·ē·əl 'lō,kād·iŋ }

radial motion [MECH] Motion in which a body moves along a line connecting it with an observer or reference point; for example, the motion of stars which move toward or away from the earth without a change in apparent position. { 'rād·ē·əl 'mō·shən }

radial-ply [DES ENG] Pertaining to the construction of a tire in which the cords run straight

across the tire, and an additional layered belt of fabric is placed around the circumference between the plies and the tread. { 'rād·ē·əl ¦plī }

radial-ply tire *See* radial tire. { ¦rād·ē·əl ¦plī 'tīr }

radial rake [MECH ENG] The angle between the cutter tooth face and a radial line passing through the cutting edge in a plane perpendicular to the cutter axis. { 'rād·ē·əl 'rāk }

radial road [CIV ENG] One of a group of roads leading outward from the center of a city in a pattern similar to spokes on a wheel. { 'rād·ē·əl ˌrōd }

radial saw [MECH ENG] A power saw that has a circular blade suspended from a transverse head mounted on a rotatable overarm. { 'rād·ē·əl 'sȯ }

radial selector *See* omnibearing selector. { 'rād·ē·əl si'lek·tər }

radial stress [MECH] Tangential stress at the periphery of an opening. { 'rād·ē·əl 'stres }

radial tire [ENG] A pneumatic tire constructed with a layer of fabric between the tread and the plies (cords), which run straight across the tire. Also known as radial-ply tire. { ¦rād·ē·əl 'tīr }

radial velocity [MECH] The component of the velocity of a body that is parallel to a line from an observer or reference point to the body; the radial velocities of stars are valuable in determining the structure and dynamics of the Galaxy. Also known as line-of-sight velocity. { 'rād·ē·əl və'läs·əd·ē }

radial wave equation [MECH] Solutions to wave equations with spherical symmetry can be found by separation of variables; the ordinary differential equation for the radial part of the wave function is called the radial wave equation. { 'rād·ē·əl ¦wāv iˌkwā·zhən }

radiant energy *See* radiation. { 'rād·ē·ənt 'en·ər·jē }

radiant-energy thermometer *See* radiation pyrometer. { 'rād·ē·ənt ¦en·ər·jē thər'mäm·əd·ər }

radiant heating [ENG] Any system of space heating in which the heat-producing means is a surface that emits heat to the surroundings by radiation rather than by conduction or convection. { 'rād·ē·ənt 'hēd·iŋ }

radiant superheater [MECH ENG] A superheater designed to transfer heat from the products of combustion to the steam primarily by radiation. { 'rād·ē·ənt 'sü·pərˌhēd·ər }

radiant-type boiler [MECH ENG] A water-tube boiler in which boiler tubes form the boundary of the furnace. { 'rād·ē·ənt ¦tīp 'bȯil·ər }

radiating power *See* emittance. { 'rād·ēˌād·iŋ 'paú·ər }

radiation [ENG] A method of surveying in which points are located by knowledge of their distances and directions from a central point. { ˌrād·ē'ā·shən }

radiation correction *See* cooling correction. { ˌrād·ē'ā·shən kəˌrek·shən }

radiation hardening [ENG] Improving the ability of a device or piece of equipment to withstand nuclear or other radiation; applies chiefly to dielectric and semiconductor materials. { ˌrād·ē'ā·shən 'härd·ənˌiŋ }

radiation loss [MECH ENG] Boiler heat loss to the atmosphere by conduction, radiation, and convection. { ˌrād·ē'ā·shən ˌlȯs }

radiation noise *See* electromagnetic noise. { ˌrād·ē'ā·shən ˌnȯiz }

radiation oven [ENG] Heating chamber relying on tungsten-filament infrared lamps with reflectors to create temperatures up to 600°F (315°C); used to dry sheet and granular material and to bake surface coatings. { ˌrād·ē'ā·shən ˌəv·ən }

radiation pyrometer [ENG] An instrument which measures the temperature of a hot object by focusing the thermal radiation emitted by the object and making some observation on it; examples include the total-radiation, optical, and ratio pyrometers. Also known as noncontact thermometer; radiant-energy thermometer; radiation thermometer. { ˌrād·ē'ā·shən pī'räm·əd·ər }

radiation shelter *See* fallout shelter. { ˌrād·ē'ā·shən ˌshel·tər }

radiation shield [ENG] A shield or wall of material interposed between a source of radiation and a radiation-sensitive body, such as a person, radiation-detection instrument, or photographic film, to protect the latter. { ˌrād·ē'ā·shən ˌshēld }

radiation thermometer *See* radiation pyrometer. { ˌrād·ē'ā·shən thər'mäm·əd·ər }

radiation vacuum gage [ENG] Vacuum (reduced-pressure) measurement device in which gas ionization from an alpha source of radiation varies measurably with changes in the density (molecular concentration) of the gas being measured. { ˌrād·ē'ā·shən 'vak·yəm ˌgāj }

radiation well logging *See* radioactive well logging. { ˌrād·ē'ā·shən 'wel ˌläg·iŋ }

radiator [ENG] Any of numerous devices, units, or surfaces that emit heat, mainly by radiation, to objects in the space in which they are installed. { 'rād·ēˌād·ər }

radiator temperature drop [MECH ENG] In internal combustion engines, the difference in temperature of the coolant liquid entering and leaving the radiator. { 'rād·ēˌād·ər 'tem·prə·chər ˌdräp }

radioacoustic position finding *See* radioacoustic ranging. { ¦rād·ē·ō·ə'küs·tik pə'zish·ən ˌfīnd·iŋ }

radioacoustic ranging [ENG] A method for finding the position of a vessel at sea; a bomb is exploded in the water, and the sound of the explosion transmitted through water is picked up by the vessel and by shore stations, other vessels, or buoys whose positions are known; the received sounds are transmitted instantaneously by radio to the surveying vessel, and the elapsed times are proportional to the distances to the known positions. Abbreviated RAR. Also known as radioacoustic position finding; radioacoustic sound ranging. { ¦rād·ē·ō·ə'küs·tik 'rānj·iŋ }

radioacoustic sound ranging *See* radioacoustic ranging. { ¦rād·ē·ō·ə'küs·tik 'saund ˌrānj·iŋ }

radioactive heat [THERMO] Heat produced within a medium as a result of absorption of radiation from decay of radioisotopes in the medium, such as thorium-232, potassium-40, uranium-238, and uranium-235. { ¦rād·ē·ō'ak·tiv 'hēt }

radioactive snow gage [ENG] A device which automatically and continuously records the water equivalent of snow on a given surface as a function of time; a small sample of a radioactive salt is placed in the ground in a lead-shielded collimator which directs a beam of radioactive particles vertically upward; a Geiger-Müller counting system (located above the snow level) measures the amount of depletion of radiation caused by the presence of the snow. { ¦rād·ē·ō'ak·tiv 'snō ˌgāj }

radioactive well logging [ENG] The recording of the differences in radioactive content (natural or neutron-induced) of the various rock layers found down an oil well borehole; types include γ-ray, neutron, and photon logging. Also known as radiation well logging; radioactivity prospecting. { ¦rād·ē·ō'ak·tiv 'wel ˌläg·iŋ }

radioactivity log [ENG] Record of radioactive well logging. { ˌrād·ē·ō·ak'tiv·əd·ē ˌläg }

radioactivity prospecting *See* radioactive well logging. { ˌrād·ē·ō·ak'tiv·əd·ē 'präˌspekt·iŋ }

radio altimeter [ENG] An absolute altimeter that depends on the reflection of radio waves from the earth for the determination of altitude, as in a frequency-modulated radio altimeter and a radar altimeter. Also known as electronic altimeter; reflection altimeter. { 'rād·ē·ō al'tim·əd·ər }

radio atmometer [ENG] An instrument designed to measure the effect of sunlight upon evaporation from plant foliage; consists of a porous-clay atmometer whose surface has been blackened so that it absorbs radiant energy. { 'rād·ē·ō at'mäm·əd·ər }

radioautography *See* autoradiography. { ¦rād·ē·ōˌȯ'täg·rə·fē }

radio autopilot coupler [ENG] Equipment providing means by which an electrical navigational signal operates an automatic pilot. { 'rād·ē·ō 'ȯd·ōˌpī·lət 'kəp·lər }

radio detection [ENG] The detection of the presence of an object by radiolocation without precise determination of its position. { 'rād·ē·ō di'tek·shən }

radio detection and location [ENG] Use of an electronic system to detect, locate, and predict future positions of earth satellites. { 'rād·ē·ō di'tek·shən ən lō'kā·shən }

radio detection and ranging *See* radar. { 'rād·ē·ō di'tek·shən ən 'rānj·iŋ }

radio Doppler [ENG] Direct determination of the radial component of the relative velocity of an object by an observed frequency change due to such velocity. { 'rād·ē·ō 'däp·lər }

radio echo observation [ENG] A method of determining the distance of objects in the atmosphere or outer space, in which a radar pulse is directed at the object and the time that elapses from transmission of the pulse to reception of a reflected pulse is measured. { 'rād·ē·ō ¦ekō ˌäb·zər'vā·shən }

radio engineering [ENG] The field of engineering that deals with the generation, transmission, and reception of radio waves and with the design, manufacture, and testing of associated equipment. { 'rād·ē·ō ˌen·jə'nir·iŋ }

radio-frequency current [ELEC] Alternating current having a frequency higher than 10,000 hertz. { 'rād·ē·ō ¦frē·kwən·sē ˌkə·rənt }

radio-frequency head [ENG] Unit consisting of a radar transmitter and part of a radar receiver, the two contained in a package for ready removal and installation. { 'rād·ē·ō ¦frē·kwən·sē 'hed }

radio-frequency heating *See* electronic heating. { 'rād·ē·ō ¦frē·kwən·sē 'hēd·iŋ }

radio-frequency preheating [ENG] Preheating of plastics-molding materials by radio frequencies of 10–100 megahertz per second to facilitate the molding operation or to reduce the molding-cycle time. Abbreviated rf preheating. { 'rād·ē·ō ¦frē·kwən·sē ¦prē'hēd·iŋ }

radio-frequency sensor [ENG] A device that uses radio signals to determine the position of objects to be manipulated by a robotic system. { 'rād·ē·ō ¦frē·kwən·sē ˌsen·sər }

radiogoniometry [ENG] Science of locating a radio transmitter by means of taking bearings on the radio waves emitted by such a transmitter. { ¦rād·ē·ōˌgō·nē'äm·ə·trē }

radio-inertial guidance system [ENG] A command type of missile guidance system consisting essentially of a radar tracking unit; a computer that accepts missile position and velocity information from the tracking system and furnishes to the command link appropriate signals to steer the missile; the command link, which consists of a transmitter on the ground and an antenna and receiver on the missile; and an inertial system for partial guidance in case of radio guidance failure. { ¦rād·ē·ō i¦nər·shəl 'gīd·ənsˌsis·təm }

radio interferometer [ENG] Radiotelescope or radiometer employing a separated receiving antenna to measure angular distances as small as 1 second of arc; records the result of interference between separate radio waves from celestial radio sources. { 'rād·ē·ō ˌin·tər·fə'räm·əd·ər }

radiolocation [ENG] Determination of relative position of an object by means of equipment operating on the principle that propagation of radio waves is at a constant velocity and rectilinear. { ¦rād·ē·ō·lō'kā·shən }

radio mast [ENG] A tower, pole, or other structure for elevating an antenna. { 'rād·ē·ō 'mast }

radiometer [ELECTR] A receiver for detecting microwave thermal radiation and similar weak wide-band signals that resemble noise and are obscured by receiver noise; examples include the Dicke radiometer, subtraction-type radiometer, and two-receiver radiometer. Also known as

microwave radiometer; radiometer-type receiver. [ENG] An instrument for measuring radiant energy; examples include the bolometer, microradiometer, and thermopile. { ˌrād·ē'äm·əd·ər }

radiopasteurization [ENG] Pasteurization by surface treatment with low-energy irradiation. { ¦rād·ē·ōˌpas·chür·ə'zā·shən }

radio position finding [ENG] Process of locating a radio transmitter by plotting the intersection of its azimuth as determined by two or more radio direction finders. { 'rād·ē·ō pə'zish·ən ˌfīnd·iŋ }

radio prospecting [ENG] Use of radio and electric equipment to locate mineral or oil deposits. { 'rād·ē·ō 'präˌspek·tiŋ }

radio shielding [ELEC] Metallic covering over all electric wiring and ignition apparatus, which is grounded at frequent intervals for the purpose of eliminating electric interference with radio communications. { 'rād·ē·ō ˌshēld·iŋ }

radiosonde [ENG] A balloon-borne instrument for the simultaneous measurement and transmission of meteorological data; the instrument consists of transducers for the measurement of pressure, temperature, and humidity, a modulator for the conversion of the output of the transducers to a quantity which controls a property of the radio-frequency signal, a selector switch which determines the sequence in which the parameters are to be transmitted, and a transmitter which generates the radio-frequency carrier. { 'rād·ē·ōˌsänd }

radiosonde-radio-wind system [ENG] An apparatus consisting of a standard radiosonde and radiosonde ground equipment to obtain upper-air data on pressure, temperature, and humidity, and a self-tracking radio direction finder to provide the elevation and azimuth angles of the radiosonde so that the wind vectors may be obtained. { 'rād·ē·ōˌsänd ¦rād·ē·ō ˌwind ˌsis·təm }

radiosonde set [ENG] A complete set for automatically measuring and transmitting high-altitude meteorological data by radio from such carriers as a balloon or rocket. { 'rād·ē·ōˌsänd ˌset }

radio sonobuoy *See* sonobuoy. { 'rād·ē·ō 'sän·əˌbȯi }

radio telescope [ENG] An astronomical instrument used to measure the amount of radio energy coming from various directions in the sky, consisting of a highly directional antenna and associated electronic equipment. { 'rād·ē·ō 'tel·əˌskōp }

radio tracking [ENG] The process of keeping a radio or radar beam set on a target and determining the range of the target continuously. { 'rād·ē·ō 'trak·iŋ }

radius cutter [MECH ENG] A formed milling cutter with teeth ground to produce a radius on the workpiece. { 'rād·ē·əs ˌkəd·ər }

radius of action [ENG] The maximum distance a ship, aircraft, or other vehicle can travel away from its base along a given course with normal load and return without refueling, but including the fuel required to perform those maneuvers made necessary by all safety and operating factors. { 'rād·ē·əs əv 'ak·shən }

radius of gyration [MECH] The square root of the ratio of the moment of inertia of a body about a given axis to its mass. { 'rād·ē·əs əv jī'rā·shən }

radius of protection [ENG] The radius of the circle within which a lightning discharge will not strike, due to the presence of an elevated lightning rod at the center. { 'rād·ē·əs əv prə'tek·shən }

radius rod [ENG] A rod which restricts movement of a part to a given arc. { 'rād·ē·əs ˌräd }

raffinate [CHEM ENG] In solvent refining, that portion of the treated liquid mixture that remains undissolved and is not removed by the selective solvent. Also known as good oil to petroleum-refinery operators. { 'raf·əˌnāt }

raft [ENG] A quantity of timber or lumber secured together by means of ropes, chains, or rods and used for transportation by floating. { raft }

rafter [BUILD] A roof-supporting member immediately beneath the roofing material. { 'raf·tər }

rafter dam [CIV ENG] A dam made of horizontal timbers that meet in the center of the stream like rafters in a roof. { 'raf·tər ˌdam }

raft foundation [CIV ENG] A continuous footing that supports an entire structure, such as a floor. Also known as foundation mat. { 'raft faùnˌdā·shən }

rag bolt *See* barb bolt. { 'rag ˌbōlt }

raggle [BUILD] **1.** A manufactured masonry unit, frequently made of terra cotta, having a slot or groove to receive a metal flashing. Also known as flashing block; raggle block. **2.** A groove cut into masonry to receive adjoining material. { 'rag·əl }

raggle block *See* raggle. { 'rag·əl ˌbläk }

rail [ENG] **1.** A bar extending between posts or other supports as a barrier or guard. **2.** A steel bar resting on the crossties to provide track for railroad cars and other vehicles with flanged wheels. [MECH ENG] A high-pressure manifold in some fuel injection systems. { rāl }

rail anchor [CIV ENG] A device that prevents tracks from moving longitudinally and maintains the proper gap between sections of rail. { 'rāl ˌaŋ·kər }

rail bender [ENG] A portable appliance for bending rails for track or for straightening bent or curved rails. { 'rāl ˌben·dər }

rail capacity [CIV ENG] The maximum number of trains which can be planned to move in both directions over a specified section of track in a 24-hour period. { 'rāl kəˌpas·əd·ē }

rail clip [CIV ENG] **1.** A plate that holds a rail at its base. **2.** A device used to fasten a derrick or crane to the rails of a track to prevent tipping. **3.** A support on a track rail, used for holding a detector bar. { 'rāl ˌklip }

rail crane *See* locomotive crane. { 'rāl ˌkrān }

railhead [CIV ENG] **1.** The topmost part of a rail, supporting the wheels of railway vehicles. **2.** A point at which railroad traffic originates and

terminates. **3.** The temporary ends of a railroad line under construction. { 'rāl,hed }

railing [CIV ENG] A barrier consisting of a rail and supports. [ELECTR] Radar pulse jamming at high recurrence rates (50 to 150 kilohertz); it results in an image on a radar indicator resembling fence railing. { 'rāl·iŋ }

rail joint [CIV ENG] A rigid connection of the ends of two sections of railway track. { 'rāl ,jȯint }

railroad [CIV ENG] A permanent line of rails forming a route for freight cars and passenger cars drawn by locomotives. { 'rāl,rōd }

railroad engineering [CIV ENG] That part of transportation engineering involved in the planning, design, development, operation, construction, maintenance, use, or economics of facilities for transportation of goods and people in wheeled units of rolling stock running on, and guided by, rails normally supported on crossties and held to fixed alignment. Also known as railway engineering. { 'rāl,rōd ˌen·jə'nir·iŋ }

railroad jack [MECH ENG] **1.** A hoist used for lifting locomotives. **2.** A portable jack for lifting heavy objects. **3.** A hydraulic jack, either powered or lever-operated. { 'rāl,rōd ˌjak }

railway dry dock [CIV ENG] A railway dock consisting of tracks built on an incline on a strong foundation, and extending from a sufficient distance in shore to allow a vessel to be hauled out of the water. { 'rāl,wā 'drī ˌdäk }

railway end-loading ramp [CIV ENG] A sloping platform situated at the end of a track and rising to the level of the floor of the railcars (wagons). { 'rāl,wā 'end ˌlōd·iŋ ˌramp }

railway engineering *See* railroad engineering. { 'rāl,wā ˌen·jə'nir·iŋ }

rain gage [ENG] An instrument designed to collect and measure the amount of rain that has fallen. Also known as ombrometer; pluviometer; udometer. { 'rān ˌgāj }

rain-gage shield [ENG] A device which surrounds a rain gage and acts to maintain horizontal flow in the vicinity of the funnel so that the catch will not be influenced by eddies generated near the gage. Also known as wind shield. { 'rān ˌgāj ˌshēld }

rain-intensity gage [ENG] An instrument which measures the instantaneous rate at which rain is falling on a given surface. Also known as rate-of-rainfall gage. { 'rān in'ten·səd·ē ˌgāj }

raised flooring [CIV ENG] A flooring system having removable panels supported on adjustable pedestals or stringers to allow convenient access to the space below. Also known as access flooring; elevated flooring; pedestal flooring. { 'rāzd 'flȯr·iŋ }

raising plate *See* wall plate. { 'rāz·iŋ ˌplāt }

Rajakaruna engine [MECH ENG] A rotary engine that uses a combustion chamber whose sides are pin-jointed together at their ends. { ˌrä·jä·kə'rün·ə ˌen·jən }

rake [BUILD] The exterior finish and trim applied parallel to the sloping end walls of a gabled roof. [DES ENG] A hand tool consisting of a long handle with a row of projecting prongs at one end; for example, the tool used for gathering leaves or grass on the ground. [ENG] The angle between an inclined plane and the vertical. [MECH ENG] The angle between the tooth face or a tangent to the tooth face of a cutting tool at a given point and a reference plane or line. { rāk }

rake blade [ENG] A blade on a bulldozer in the form of spaced tines that point down. { 'rāk ˌblād }

raked joint [CIV ENG] A mortar, or masonry, joint from which the mortar has been scraped out to about 3/4 inch (20 millimeters). { 'rākt ˌjȯint }

ram [MECH ENG] A plunger, weight, or other guided structure for exerting pressure or drawing something by impact. { ram }

ram effect [MECH ENG] The increased air pressure in a jet engine or in the manifold of a piston engine, due to ram. { 'ram i,fekt }

rammer [ENG] An instrument for driving something, such as wood or stones, into another material with force. Also known as beetle; maul. { 'ram·ər }

ramming [ENG] Packing a powder metal or sand into a compact mass. { 'ram·iŋ }

ramp [ENG] **1.** A uniformly sloping platform, walkway, or driveway. **2.** A stairway which gives access to the main door of an airplane. { ramp }

ram penetrometer *See* ramsonde. { 'ram ˌpen·ə'träm·əd·ər }

ramping [ENG] In the production of parts fabricated from composite materials, a gradual and programmed sequence of changes in temperature or pressure that control curing and cooling. { 'ramp·iŋ }

RAMPS *See* resource allocation in multiproject scheduling. { ramps }

Ramsay-Shields-Eötvös equation [THERMO] An elaboration of the Eötvös rule which states that at temperatures not too near the critical temperature, the molar surface energy of a liquid is proportional to t_c-t-6 K, where t is the temperature and t_c is the critical temperature. { 'ram·zē 'shēlz 'ȯt·vȯsh i,kwā·zhən }

Ramsay-Young method [THERMO] A method of measuring the vapor pressure of a liquid, in which a thermometer bulb is surrounded by cotton wool soaked in the liquid, and the pressure, measured by a manometer, is reduced until the thermometer reading is steady. { ˌram·zē 'yəŋ ˌmeth·əd }

Ramsay-Young rule [THERMO] An empirical relationship which states that the ratio of the absolute temperatures at which two chemically similar liquids have the same vapor pressure is independent of this vapor pressure. { 'ram·zē 'yəŋ ˌrül }

ramsonde [ENG] A cone-tipped metal rod or tube that is driven downward into snow to measure its hardness. Also known as ram penetrometer. { 'ram,sänd }

ram travel [ENG] In injection or transfer molding, the distance moved by the injection ram when filling the mold. { 'ram ˌtrav·əl }

ram-type turret lathe [MECH ENG] A horizontal turret lathe in which the turret is mounted on a ram or slide which rides on a saddle. { 'ram ˌtīp 'tər·ət ˌlāth }

random length [ENG] One of a group of various lengths of pipe as delivered by the manufacturer, usually 13–23 feet (4–7 meters) long. Also known as mill length. { 'ran·dəm 'leŋkth }

random line [ENG] A trial surveying line that is directed as closely as circumstances permit toward a fixed terminal point that cannot be seen from the initial point. Also known as random traverse. { 'ran·dəm 'līn }

random-sampling voltmeter [ENG] A sampling voltmeter which takes samples of an input signal at random times instead of at a constant rate; the synchronizing portions of the instrument can then be simplified or eliminated. { 'ran·dəm ˈsam·pliŋ 'vōltˌmēd·ər }

random traverse *See* random line. { 'ran·dəm trəˈvərs }

random vibration [MECH] A varying force acting on a mechanical system which may be considered to be the sum of a large number of irregularly timed small shocks; induced typically by aerodynamic turbulence, airborne noise from rocket jets, and transportation over road surfaces. { 'ran·dəm vīˈbrā·shən }

range [CIV ENG] Any series of contiguous townships of the U.S. Public Land Survey system. [CONT SYS] **1.** The maximum distance a robot's arm or wrist can travel. Also known as reach. **2.** The volume comprising the locations to which a robot's arm or wrist can travel. [ENG] **1.** The distance capability of an aircraft, missile, gun, radar, or radio transmitter. **2.** A line defined by two fixed landmarks, used for missile or vehicle testing and other test purposes. [MECH] The horizontal component of a projectile displacement at the instant it strikes the ground. { rānj }

range calibration [ENG] Adjustment of a radar set so that when on target the set will indicate the correct range. { 'rānj ˌkal·əˌbrā·shən }

range coding [ENG] Method of coding a radar transponder beacon response so that it appears as a series of illuminated bars on a radarscope; the coding provides identification. { 'rānj ˌkōd·iŋ }

range corrector setting [ENG] Degree to which the range scale of a position-finding apparatus must be adjusted before use. { 'rānj kəˈrek·tər ˌsed·iŋ }

range deviation [MECH] Distance by which a projectile strikes beyond, or short of, the target; the distance as measured along the gun-target line or along a line parallel to the gun-target line. { 'rānj ˌdē·vēˈā·shən }

range discrimination *See* distance resolution. { 'rānj diˌskrim·əˈnā·shən }

rangefinder [ELECTR] A device which determines the distance to an object by measuring the time it takes for a radio wave to travel to the object and return. *See* optical rangefinder. { 'rānj ˌfīnd·ər }

range-height indicator [ENG] A scope which simultaneously indicates range and height of a radar target; this presentation is commonly used by height finders. { 'rānj 'hīt ˌin·dəˌkād·ər }

range-imaging sensor [ENG] A robotic device that makes precise measurements, by using the principles of algebra, trigonometry, and geometry, of the distance from a robot's end effector to various parts of an object, in order to form an image of the object. { 'rānj ˈim·ij·iŋ ˌsen·sər }

range marker *See* distance marker. { 'rānj ˌmär·kər }

range pole *See* range rod. { 'rānj ˌpōl }

range recorder [ENG] An item which makes a permanent representation of distance, expressed as range, versus time. [ENG ACOUS] A display used in sonar in which a stylus sweeps across a paper moving at a constant rate and chemically treated so that it is darkened by an electrical signal from the stylus; the stylus starts each sweep as a sound pulse is emitted so that the distance along the trace at which the echo signal appears is a measure of the range to the target. { 'rānj riˌkȯrd·ər }

range resolution *See* distance resolution. { 'rānj ˌrez·əˌlü·shən }

range rod [ENG] A long (6–8 feet or 1.8–2.4 meters) rod fitted with a sharp-pointed metal shoe and usually painted in 1-foot (30-centimeter) bands of alternate red and white; used for sighting points and lines in surveying or for showing the position of a ground point. Also known as line rod; lining pole; range pole; ranging rod; sight rod. { 'rānj ˌräd }

range sensing [ENG] The precise measurement of the distance of a device from a robot's end effector. { 'rānj ˌsens·iŋ }

range surveillance [ENG] Surveillance of a missile range by means of electronic and other equipment. { 'rānj sərˌvā·ləns }

ranging rod *See* range rod. { 'rānj·iŋ ˌräd }

rank [MECH ENG] The number of rotational joints belonging to a robot. { raŋk }

Rankine cycle [THERMO] An ideal thermodynamic cycle consisting of heat addition at constant pressure, isentropic expansion, heat rejection at constant pressure, and isentropic compression; used as an ideal standard for the performance of heat-engine and heat-pump installations operating with a condensable vapor as the working fluid, such as a steam power plant. Also known as steam cycle. { 'raŋ·kən ˌsī·kəl }

Rankine efficiency [MECH ENG] The efficiency of an ideal engine operating on the Rankine cycle under specified conditions of steam temperature and pressure. { 'raŋ·kən iˌfish·ən·sē }

Rankine-Hugoniot equations [THERMO] Equations, derived from the laws of conservation of mass, momentum, and energy, which relate the velocity of a shock wave and the pressure, density, and enthalpy of the transmitting fluid before and after the shock wave passes. { 'raŋ·kən yü'gō·nē·ō iˌkwā·zhənz }

Rankine temperature scale [THERMO] A scale of absolute temperature; the temperature in degrees Rankine (°R) is equal to 9/5 of the temperature in kelvins and to the temperature in degrees Fahrenheit plus 459.67. { 'raŋ·kən 'tem·prə·chər ˌskāl }

ranking method [IND ENG] A system of job evaluation wherein each job as a whole is given a rank with respect to all the other jobs, and no attempt is made to establish a measure of value. { 'raŋk·iŋ ˌmeth·əd }

Ranney well [CIV ENG] A well that has a center caisson with horizontal perforated pipes extending radially into an aquifer; particularly applicable to the development of thin aquifers at shallow depths. { 'ran·ē ˌwel }

rapid prototyping [IND ENG] A modeling process used in product design in which a CAD drawing of a part is processed to create a file of the part in slices, and then a part is built by depositing layer (slice) upon layer of material; includes stereolithography, selective laser sintering, or fused deposition modeling. { ˌrap·əd 'prōd·əˌtīp·iŋ }

rapid sand filter [CIV ENG] A system for purifying water, which is forced through layers of sand and gravel under pressure. { 'rap·əd 'sand ˌfil·tər }

rapid traverse [MECH ENG] A machine tool mechanism which rapidly repositions the workpiece while no cutting takes place. { 'rap·əd trə'vərs }

Raschig process [CHEM ENG] A method for production of phenol that begins with a first-stage chlorination of benzene, using an air-hydrochloric acid mixture. { 'rä·shik 'prä·səs }

Raschig ring [CHEM ENG] A type of packing in the shape of a short pipe; used in columns for absorption operations, and to a limited extent for distillation operations. { 'rä·shik ˌriŋ }

RA size [ENG] One of a series of sizes to which untrimmed paper is manufactured; for reels of paper, the standard sizes in millimeters are 430, 610, 860, and 1220; for sheets of paper, the sizes are RA0, 860 × 1220; RA1, 610 × 860; RA2, 430 × 610; RA sizes correspond to A sizes when trimmed. { ˌär'ā ˌsīz }

rasp [DES ENG] A metallic tool with a rough surface of small points used for shaping and finishing metal, plaster, stone, and wood; designed in a number of useful curved shapes. { rasp }

ratchet [DES ENG] A wheel, usually toothed, operating with a catch or a pawl so as to rotate in only a single direction. { 'rach·ət }

ratchet coupling [MECH ENG] A coupling between two shafts that uses a ratchet to allow the driven shaft to be turned in one direction only, and also to permit the driven shaft to overrun the driving shaft. { 'rach·ət ˌkəp·liŋ }

ratchet jack [DES ENG] A jack operated by a ratchet mechanism. { 'rach·ət ˌjak }

ratchet tool [DES ENG] A tool in which torque or force is applied in one direction only by means of a ratchet. { 'rach·ət ˌtül }

rat distillate [CHEM ENG] A refinery designation for gasoline and other fuels as they come from the condenser, before undesirable substances are removed by further processing. { 'rat ˌdist·əl·ət }

rate action *See* derivative action. { 'rāt ˌak·shən }

rate control [CONT SYS] A form of control in which the position of a controller determines the rate or velocity of motion of a controlled object. Also known as velocity control. { 'rāt kənˌtrōl }

rated capacity [MECH ENG] The maximum capacity for which a boiler is designed, measured in pounds of steam per hour delivered at specified conditions of pressure and temperature. { 'rād·əd kə'pas·əd·ē }

rated engine speed [MECH ENG] The rotative speed of an engine specified as the allowable maximum for continuous reliable performance. { 'rād·əd 'en·jən ˌspēd }

rated flow [ENG] **1.** Normal operating flow rate at which a fluid product is passed through a vessel or piping system. **2.** Flow rate for which a vessel or process system is designed. { 'rād·əd 'flō }

rated horsepower [MECH ENG] The normal maximum, allowable, continuous power output of an engine, turbine motor, or other prime mover. { 'rād·əd 'hȯrsˌpau·ər }

rated load [MECH ENG] The maximum load a machine is designed to carry. { 'rād·əd 'lōd }

rated relieving capacity [DES ENG] The measured relieving capacity for which the pressure relief device is rated in accordance with the applicable code or standard. { 'rād·əd ri'lēv·iŋ kəˌpas·əd·ē }

rate effect [ELECTR] The phenomenon of a *pnpn* device switching to a high-conduction mode when anode voltage is applied suddenly or when high-frequency transients exist. { 'rāt iˌfekt }

rate feedback [ELECTR] The return of a signal, proportional to the rate of change of the output of a device, from the output to the input. { 'rāt 'fēdˌbak }

rate-grown transistor [ELECTR] A junction transistor in which both impurities (such as gallium and antimony) are placed in the melt at the same time and the temperature is suddenly raised and lowered to produce the alternate *p*-type and *n*-type layers of rate-grown junctions. Also known as graded-junction transistor. { 'rāt ˌgrōn tran 'zis·tər }

rate gyroscope [MECH ENG] A gyroscope that is suspended in just one gimbal whose bearings form its output axis and which is restrained by a spring; rotation of the gyroscope frame about an axis perpendicular to both spin and output axes produces precession of the gimbal within the bearings proportional to the rate of rotation. { 'rāt 'jī·rəˌskōp }

rate integrating gyroscope [MECH ENG] A single-degree-of-freedom gyro having primarily viscous restraint of its spin axis about the output axis; an output signal is produced by gimbal angular displacement, relative to the base, which

is proportional to the integral of the angular rate of the base about the input axis. { 'rāt ¦int·ə,grād·iŋ ,ī·rə,skōp }

rate of change of acceleration [MECH] Time rate of change of acceleration; this rate is a factor in the design of some items of ammunition that undergo large accelerations. { 'rāt əv 'chānj əv ik,sel·ə'rā·shən }

rate-of-flow control valve *See* flow control valve. { 'rāt əv 'flō kən¦trōl ,valv }

rate-of-rainfall gage *See* rain-intensity gage. { 'rāt əv 'rān,fôl ,gāj }

rate of rise [ENG] The time rate of pressure increase during an isolation test for leaks. { 'rāt əv 'rīz }

rate response [ENG] Quantitative expression of the output rate of a control system as a function of its input signal. { 'rāt ri,späns }

rate servomechanism *See* velocity servomechanism. { 'rāt ¦sər·vō'mek·ə,niz·əm }

rating [ENG] A designation of an operating limit for a machine, apparatus, or device used under specified conditions. { 'rād·iŋ }

ratio control system [CONT SYS] Control system in which two process variables are kept at a fixed ratio, regardless of the variation of either of the variables, as when flow rates in two separate fluid conduits are held at a fixed ratio. { 'rā·shō kən'trōl ,sis·təm }

ratio delay study *See* work sampling. { 'rā·shō di'lā ,stəd·ē }

ratio meter [ENG] A meter that measures the quotient of two electrical quantities; the deflection of the meter pointer is proportional to the ratio of the currents flowing through two coils. { 'rā·shō ,mēd·ər }

ratio of expansion [MECH ENG] The ratio of the volume of steam in the cylinder of an engine when the piston is at the end of a stroke to that when the piston is in the cutoff position. { 'rā·shō əv ik'span·shən }

ratio of reduction [ENG] The ratio of the maximum size of the stone which will enter a crusher, to the size of its product. { 'rā·shō əv ri'dək·shən }

rattail file [DES ENG] A round tapering file used for smoothing or enlarging holes. { 'rat,tāl 'fīl }

Rauschelback rotor [ENG] A free-turning S-shaped propeller used to measure ocean currents; the number of rotations per unit time is proportional to the flow. { 'raüsh·əl,bak ,rōd·ər }

raw material [IND ENG] A crude, unprocessed or partially processed material used as feedstock for a processing operation; for example, crude petroleum, raw cotton, or steel scrap. Also known as crude material. { 'rȯ mə'tir·ē·əl }

raw sewage [CIV ENG] Untreated waste materials. { 'rȯ 'sü·ij }

raw sludge [CIV ENG] Sewage sludge preliminary to primary and secondary treatment processes. { 'rȯ 'sləj }

raw water [CIV ENG] Water that has not been purified. { 'rȯ 'wȯd·ər }

Raykin fender [CIV ENG] Sandwich-type fender buffer to protect docks from the impact of mooring ships; made of a connected series of steel plates cemented to layers of rubber. { 'rā·kən ,fen·dər }

Rayleigh line [MECH] A straight line connecting points corresponding to the initial and final states on a graph of pressure versus specific volume for a substance subjected to a shock wave. { 'rā·lē ,līn }

Rayleigh number 2 [THERMO] A dimensionless number used in studying free convection, equal to the product of the Grashof number and the Prandtl number. Symbolized R'_2. { 'rā·lē ¦nəm·bər 'tü }

Rayleigh number 3 [THERMO] A dimensionless number used in the study of combined free and forced convection in vertical tubes, equal to Rayleigh number 2 times the Nusselt number times the tube diameter divided by its entry length. Symbolized Ra_3. { 'rā·lē ¦nəm·bər 'thrē }

Rayleigh's dissipation function [MECH] A function which enters into the equations of motion of a system undergoing small oscillations and represents frictional forces which are proportional to velocities; given by a positive definite quadratic form in the time derivatives of the coordinates. Also known as dissipation function. { 'rā·lē ,dis·ə'pā·shən ,fəŋk·shən }

Rayleigh wave [MECH] A wave which propagates on the surface of a solid; particle trajectories are ellipses in planes normal to the surface and parallel to the direction of propagation. Also known as surface wave. { 'rā·lē ,wāv }

Raymond concrete pile [CIV ENG] A pile made by driving a thin steel shell into the ground with a tapered mandrel and filling it with concrete. { 'rā·mənd ¦kän¦krēt ,pīl }

R-C amplifier *See* resistance-capacitance coupled amplifier. { ¦är¦sē 'am·plə,fī·ər }

R-C coupled amplifier *See* resistance-capacitance coupled amplifier. { ¦är¦sē ¦kəp·əld 'am·plə,fī·ər }

R-C coupling *See* resistance coupling. { ¦är¦sē 'kəp·liŋ }

R-C oscillator *See* resistance-capacitance oscillator. { ¦är¦sē 'äs·ə,lād·ər }

RDC extractor *See* rotary-disk contactor. { ¦är ¦dē'sē ik'strak·tər }

reach [CIV ENG] A portion of a waterway between two locks or gages. [CONT SYS] *See* range. [ENG] The length of a channel, uniform with respect to discharge, depth, area, and slope. { rēch }

reach rod [MECH ENG] A rod motion in a link used to transmit motion from the reversing rod to the lifting shaft. { 'rēch ,räd }

reactance [ELEC] The imaginary part of the impedance of an alternating-current circuit. { rē'ak·təns }

reactance drop [ELEC] The component of the phasor representing the voltage drop across a component or conductor of an alternating-current circuit which is perpendicular to the current. { rē'ak·təns ,dräp }

reactance grounded [ELEC] Grounded through a reactance. { rē'ak·təns ˌgraùn·dəd }

reaction [CONT SYS] *See* positive feedback. [MECH] The equal and opposite force which results when a force is exerted on a body, according to Newton's third law of motion. { rē'ak·shən }

reaction injection molding [ENG] A plastics fabrication process in which two streams of highly reactive, low-molecular-weight, low-viscosity resin systems are combined to form a solid material. { rē'ək·shən in'jek·shən 'mōl·diŋ }

reactions inventory [IND ENG] A summary of the various possible responses of an individual to a stimulus or group of stimuli. { rē'ak·shənz 'in·venˌtȯr·ē }

reaction turbine [MECH ENG] A power-generation prime mover utilizing the steady-flow principle of fluid acceleration, where nozzles are mounted on the moving element. { rē'ak·shən ˌtər·bən }

reaction wheel [MECH ENG] A device capable of storing angular momentum which may be used in a space ship to provide torque to effect or maintain a given orientation. { rē'ak·shən ˌwēl }

reaction zone [CHEM ENG] In a catalytic reactor vessel, the location or zone within the vessel where the bulk of the chemical reaction takes place. { rē'ak·shən ˌzōn }

reactive [ELEC] Pertaining to either inductive or capacitance reactance; a reactive circuit has a high value of reactance in comparison with resistance. { rē'ak·tiv }

reactive ion etching [ELECTR] A directed chemical etching process used in integrated circuit fabrication in which chemically active ions are accelerated along electric field lines to meet a substrate perpendicular to its surface. { rē'ak·tiv 'īˌän ˌech·iŋ }

reactive muffler [ENG] A muffler that attenuates by reflecting sound back to the source. Also known as nondissipative muffler. { rē'ak·tiv 'məf·lər }

reactive volt-ampere meter *See* varmeter. { rē'ak·tiv 'vōlt 'amˌpir ˌmēd·ər }

reactor [CHEM ENG] Device or process vessel in which chemical reactions (catalyzed or noncatalyzed) take place during a chemical conversion type of process. [ELEC] A device that introduces either inductive or capacitive reactance into a circuit, such as a coil or capacitor. Also known as electric reactor. { rē'ak·tər }

read [ELECTR] To generate an output corresponding to the pattern stored in a charge storage tube. { rēd }

Read diode [ELECTR] A high-frequency semiconductor diode consisting of an avalanching *pn* junction, biased to fields of several hundred thousand volts per centimeter, at one end of a high-resistance carrier serving as a drift space for the charge carriers. { 'rēd ˌdīˌōd }

readiness time [ENG] The length of time required to obtain a stabilized system ready to perform its intended function (readiness time includes warm-up time); the time is measured from the point when the system is unassembled or uninstalled to such time as it can be expected to perform as accurately as at any later time; maintenance time is excluded from readiness time. { 'rēd·i·nəs ˌtīm }

reading [ENG] **1.** The indication shown by an instrument. **2.** Observation of the readings of one or more instruments. { 'rēd·iŋ }

reading point *See* breakpoint. { 'rēd·iŋ ˌpȯint }

real gas [THERMO] A gas, as considered from the viewpoint in which deviations from the ideal gas law, resulting from interactions of gas molecules, are taken into account. Also known as imperfect gas. { 'rēl 'gas }

realizability [CONT SYS] Property of a transfer function that can be realized by a network that has only resistances, capacitances, inductances, and ideal transformers. { ˌrē·əˌlīz·ə'bil·əd·ē }

ream [ENG] To enlarge or clean out a hole. { rēm }

reamer [DES ENG] A tool used to enlarge, shape, smooth, or otherwise finish a hole. { 'rēm·ər }

reaming bit [DES ENG] A bit used to enlarge a borehole. Also known as broaching bit; pilot reaming bit. { 'rēm·iŋ ˌbit }

rear response [ENG ACOUS] The maximum pressure within 60° of the rear of a transducer in decibels relative to the pressure on the acoustic axis. { 'rir riˌspäns }

Réaumur temperature scale [THERMO] Temperature scale where water freezes at 0°R and boils at 80°R. { ˌrā·ōˌmyůr 'tem·prə·chər ˌskāl }

rebar [CIV ENG] A steel bar or rod used to reinforce concrete. { 'rēˌbär }

reboiler [CHEM ENG] An auxiliary heating unit for a fractionating tower designed to supply additional heat to the lower portion of the tower; liquid withdrawn from the side or bottom of the tower is reheated by heat exchange, then reintroduced into the tower. { rē'bȯil·ər }

rebound clip [DES ENG] A clip surrounding the back and one or two other leaves of a leaf spring, to distribute the load during rebounds. { 'rēˌbaůnd ˌklip }

rebound leaf [DES ENG] In a leaf spring, a leaf placed over the master leaf to limit the rebound and help carry the load imposed by it. { 'rēˌbaůnd ˌlēf }

rebreather [ENG] A closed-loop oxygen supply system consisting of gas supply and face mask. { rē'brēth·ər }

rebuild [ENG] To restore to a condition comparable to new by disassembling the item to determine the condition of each of its component parts, and reassembling it, using serviceable, rebuilt, or new assemblies, subassemblies, and parts. { rē'bild }

receiver [CHEM ENG] Vessel, container, or tank used to receive and collect liquid material from a process unit, such as the distillate receiver from the overhead condenser of a distillation column. [ELECTR] The complete equipment required for receiving modulated radio waves

and converting them into the original intelligence, such as into sounds or pictures, or converting to desired useful information as in a radar receiver. [MECH ENG] An apparatus placed near the compressor to equalize the pulsations of the air as it comes from the compressor to cause a more uniform flow of air through the pipeline and to collect moisture and oil carried in the air. { ri'sē·vər }

receiving gage [ENG] A fixed gage designed to inspect a number of dimensions and also their reaction to each other. { ri'sēv·iŋ ˌgāj }

receiving house [CHEM ENG] A building where liquid streams from petroleum-refining-process condensers are observed through a look box, and samples are taken for testing, and also where products are diverted to storage tanks or to other processing units. { ri'sēv·iŋ ˌhaůs }

receiving station [MECH ENG] The location or device on conveyor systems where bulk material is loaded or otherwise received onto the conveyor. { ri'sēv·iŋ ˌstā·shən }

receiving tank *See* rundown tank. { ri'sēv·iŋ ˌtaŋk }

recess [ENG] A surface groove or depression. { 'rēˌses }

recessed bead *See* quirk bead. { 'rēˌsest ˌbēd }

recessed tube wall [MECH ENG] A boiler furnace wall which has openings to partially expose waterwall tubes to the radiant combustion gases. { 'rēˌsest 'tüb ˌwȯl }

recharge basin [CIV ENG] A basin constructed in sandy material to collect water, as from storm drains, for the purpose of replenishing groundwater supply. { 'rēˌchärj ˌbās·ən }

reciprocal impedance [ELEC] Two impedances Z_1 and Z_2 are said to be reciprocal impedances with respect to an impedance Z (invariably a resistance) if they are so related as to satisfy the equation $Z_1Z_2 = Z^2$. { ri'sip·rə·kəl im'pēd·əns }

reciprocal leveling [CIV ENG] A variant of straight differential leveling applied to long distances in which levels are taken on two points, and the average of the two elevation differences is the true difference. { ri'sip·rə·kəl 'lev·ə·liŋ }

reciprocal ohm *See* siemens. { ri'sip·rə·kəl 'ōm }

reciprocal ohm centimeter *See* roc. { ri'sip·rə·kəl 'ōm 'sent·iˌmēd·ər }

reciprocal strain ellipsoid [MECH] In elastic theory, an ellipsoid of certain shape and orientation which under homogeneous strain is transformed into a set of orthogonal diameters of the sphere. { ri'sip·rə·kəl ¦strān i'¦lipˌsȯid }

reciprocating compressor [MECH ENG] A positive-displacement compressor having one or more cylinders, each fitted with a piston driven by a crankshaft through a connecting rod. { ri'sip·rəˌkād·iŋ kəm'pres·ər }

reciprocating drill *See* piston drill. { ri'sip·rəˌkād·iŋ 'dril }

reciprocating engine *See* piston engine. { ri'sip·rəˌkād·iŋ 'en·jən }

reciprocating flight conveyor [MECH ENG] A reciprocating beam or beams with hinged flights that advance materials along a conveyor trough. { ri'sip·rəˌkād·iŋ 'flīt kənˌvā·ər }

reciprocating-plate column *See* reciprocating-plate extractor. { ri'sip·rəˌkād·iŋ ¦plāt 'käl·əm }

reciprocating-plate extractor [CHEM ENG] A liquid-liquid contactor in which equally spaced perforated plates (as in a distillation column) move up and down rapidly over a short distance to cause liquid agitation and mixing. Also known as reciprocating-plate column. { ri'sip·rəˌkād·iŋ ¦plāt ik'strak·tər }

reciprocating-plate feeder [MECH ENG] A back-and-forth shaking tray used to feed abrasive materials, such as pulverized coal, into process units. { ri'sip·rəˌkād·iŋ ¦plāt 'fēd·ər }

reciprocating pump *See* piston pump. { ri'sip·rəˌkād·iŋ 'pəmp }

reciprocating screen [MECH ENG] Horizontal solids-separation screen (sieve) oscillated back and forth by an eccentric gear; used for solids classification. { ri'sip·rəˌkād·iŋ 'skrēn }

reciprocity calibration [ENG ACOUS] A measurement of the projector loss and hydrophone loss of a reversible transducer by means of the reciprocity theorem and comparisons with the known transmission loss of an electric network, without knowing the actual value of either the electric power or the acoustic power. { ˌres·ə'präs·əd·ē ˌkal·əˌbrā·shən }

reciprocity theorem Also known as principle of reciprocity. [ELEC] **1.** The electric potentials V_1 and V_2 produced at some arbitrary point, due to charge distributions having total charges of q_1 and q_2 respectively, are such that $q_1V_2 = q_2V_1$. **2.** In an electric network consisting of linear passive impedances, the ratio of the electromotive force introduced in any branch to the current in any other branch is equal in magnitude and phase to the ratio that results if the positions of electromotive force and current are exchanged. [ENG ACOUS] The sensitivity of a reversible electroacoustic transducer when used as a microphone divided by the sensitivity when used as a source of sound is independent of the type and construction of the transducer. { ˌres·ə'präs·əd·ē ˌthir·əm }

recirculating-ball steering [MECH ENG] A steering system that transmits steering movements by means of steel balls placed between a worm gear and a nut. { rē'sər·kyəˌlād·iŋ ¦bȯl 'stir·iŋ }

recirculator [ENG] A self-contained underwater breathing apparatus that recirculates an oxygen supply (mix-gas or pure) to the diver until the oxygen is depleted. { rē'sər·kyəˌlād·ər }

reclamation [CIV ENG] **1.** The recovery of land or other natural resource that has been abandoned because of fire, water, or other cause. **2.** Reclaiming dry land by irrigation. { ˌrek·lə'mā·shən }

recoil *See* gun reaction. { 'rēˌkȯil }

reconditioning [ENG] Restoration of an object to a good condition. { ˌrē·kən'dish·ən·iŋ }

reconnaissance [ENG] A mission to secure

data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. { ri'kän·ə·səns }

reconnaissance survey [ENG] A preliminary survey, usually executed rapidly and at relatively low cost, prior to mapping in detail and with greater precision. { ri'kän·ə·səns ˌsərˌvā }

record changer [ENG ACOUS] A record player that plays a number of records automatically in succession. { 'rek·ərd ˌchānj·ər }

recorder *See* recording instrument. { ri'kȯrd·ər }

recording head [ELECTR] A magnetic head used only for recording. Also known as record head. *See* cutter. { ri'kȯrd·iŋ ˌhed }

recording instrument [ENG] An instrument that makes a graphic or acoustic record of one or more variable quantities. Also known as recorder. { ri'kȯrd·iŋ ˌin·strə·mənt }

recording optical tracking instrument [ENG] Optical system used for recording data in connection with missile flights. { ri'kȯrd·iŋ ˈäp·tə·kəl 'trak·iŋ ˌin·strə·mənt }

recording rain gage [ENG] A rain gage which automatically records the amount of precipitation collected, as a function of time. Also known as pluviograph. { ri'kȯrd·iŋ 'rān ˌgāj }

recording thermometer *See* thermograph. { ri 'kȯrd·iŋ thərˌmäm·əd·ər }

record player [ENG ACOUS] A motor-driven turntable used with a phonograph pickup to obtain audio-frequency signals from a phonograph record. { 'rek·ərd ˌplā·ər }

recovery [MECH] The return of a body to its original dimensions after it has been stressed, possibly over a considerable period of time. { ri'kəv·ə·rē }

recovery vehicle [MECH ENG] A special-purpose vehicle equipped with winch, hoist, or boom for recovery of vehicles. { ri'kəv·ə·rē ˌvē·ə·kəl }

rectangular weir [CIV ENG] A weir with a rectangular notch at top for measurement of water flow in open channels; it is simple, easy to make, accurate, and popular. { rek'taŋ·gyə·lər 'wer }

rectification [CIV ENG] A new alignment to correct a deviation of a stream channel or bank. [ELEC] The process of converting an alternating current to a unidirectional current. { ˌrek·tə·fə'kā·shən }

rectification distillation [CHEM ENG] A distillation technique in which a rectifying column is used. { ˌrek·tə·fə'kā·shən ˌdis·tə'lā·shən }

rectification factor [ELECTR] Quotient of the change in average current of an electrode by the change in amplitude of the alternating sinusoidal voltage applied to the same electrode, the direct voltages of this and other electrodes being maintained constant. { ˌrek·tə·fə'kā·shən ˌfak·tər }

rectifier [ELEC] A nonlinear circuit component that allows more current to flow in one direction than the other; ideally, it allows current to flow in one direction unimpeded but allows no current to flow in the other direction. { 'rek·təˌfī·ər }

rectifier filter [ELECTR] An electric filter used in smoothing out the voltage fluctuation of an electron tube rectifier, and generally placed between the rectifier's output and the load resistance. { 'rek·təˌfī·ər ˌfil·tər }

rectifier instrument [ENG] Combination of an instrument sensitive to direct current and a rectifying device whereby alternating current (or voltages) may be rectified for measurement. { 'rek·təˌfī·ər ˌin·strə·mənt }

rectifier rating [ELECTR] A performance rating for a semiconductor rectifier, usually on the basis of the root-mean-square value of sinusoidal voltage that it can withstand in the reverse direction and the average current density that it will pass in the forward direction. { 'rek·təˌfī·ər ˌrād·iŋ }

rectifier stack [ELECTR] A dry-disk rectifier made up of layers or stacks of disks of individual rectifiers, as in a selenium rectifier or copper-oxide rectifier. { 'rek·təˌfī·ər ˌstak }

rectifier transformer [ELECTR] Transformer whose secondary supplies energy to the main anodes of a rectifier. { 'rek·təˌfī·ər tranz'fȯr·mər }

rectifying column [CHEM ENG] Portion of a distillation column above the feed tray in which rising vapor is enriched by interaction with a countercurrent falling stream of condensed vapor; contrasted to the stripping column section below the column feed tray. { 'rek·təˌfī·iŋ ˌkäl·əm }

rectilinear motion [MECH] A continuous change of position of a body so that every particle of the body follows a straight-line path. Also known as linear motion. { ˌrek·tə'lin·ē·ər 'mō·shən }

recuperative air heater [ENG] An air heater in which the heat-transferring metal parts are stationary and form a separating boundary between the heating and cooling fluids. { rē'küp·rəd·iv 'er ˌhēd·ər }

recuperator [ENG] An apparatus in which heat is conducted from the combustion products to incoming cooler air through a system of thin-walled ducts. { rē'kü·pəˌrād·ər }

recurring demand [IND ENG] A request made periodically or anticipated to be repetitive by an authorized requisitioner for material for consumption or use, or for stock replenishment. { ri'kər·iŋ di'mand }

recycle mixing [CHEM ENG] The mixing of a portion of a product stream (fluid or solid) from a processing unit with incoming raw feed. { rē'sī·kəl ˌmiks·iŋ }

recycle ratio [CHEM ENG] In a continuous chemical process, the ratio of recycle stock to fresh feed. { rē'sī·kəl ˌrā·shō }

recycle stock [CHEM ENG] That portion of a feedstock that has passed through a processing unit and is recirculated (recycled) back through the process. { rē'sī·kəl ˌstäk }

recycling [ELECTR] Returning to an original condition, as to 0 or 1 in a counting circuit. [ENG] The extraction and recovery of valuable

materials from scrap or other discarded materials. { rē'sīk·liŋ }

Redler conveyor [MECH ENG] A conveyor in which material is dragged through a duct by skeletonized or U-shaped impellers which move the material in which they are submerged because the resistance to slip through the element is greater than the drag against the walls of the duct. { 'red·lər kən'vā·ər }

redox cell [ELEC] Cell designed to convert the energy of reactants to electrical energy; an intermediate reductant, in the form of liquid electrolyte, reacts at the anode in a conventional manner; it is then regenerated by reaction with a primary fuel. { 'rē,däks ˌsel }

reduced frequency *See* Strouhal number. { ri 'düst 'frē·kwən·sē }

reduced inspection [IND ENG] The decrease in the number of items inspected from that specified in the original sampling plan because the quality of the item has consistently improved. { ri'düst in'spek·shən }

reduced mass [MECH] For a system of two particles with masses m_1 and m_2 exerting equal and opposite forces on each other and subject to no external forces, the reduced mass is the mass m such that the motion of either particle, with respect to the other as origin, is the same as the motion with respect to a fixed origin of a single particle with mass m acted on by the same force; it is given by $m = m_1m_2/(m_1 + m_2)$. { ri'düst 'mas }

reduced-order controller [CONT SYS] A control algorithm in which certain modes of the structure to be controlled are ignored, to enable control commands to be computed with sufficient rapidity. { ri'düst ¦ȯr·dər kən'trōl·ər }

reduced pressure [THERMO] The ratio of the pressure of a substance to its critical pressure. { ri'düst 'presh·ər }

reduced-pressure distillation *See* vacuum distillation. { ri'düst ¦presh·ər ˌdis·tə'lā·shən }

reduced property *See* reduced value. { ri'düst 'präp·ərd·ē }

reduced temperature [THERMO] The ratio of the temperature of a substance to its critical temperature. { ri'düst 'tem·prə·chər }

reduced value [THERMO] The actual value of a quantity divided by the value of that quantity at the critical point. Also known as reduced property. { ri'düst 'val·yü }

reduced viscosity [ENG] In plastics processing, the ratio of the specific viscosity to concentration. { ri'düst vi'skäs·əd·ē }

reduced volume [THERMO] The ratio of the specific volume of a substance to its critical volume. { ri'düst 'väl·yəm }

reducer [DES ENG] A fitting having a larger size at one end than at the other and threaded inside, unless specifically flanged or for some special joint. { ri'dü·sər }

reducing coupling [ENG] A coupling used to connect a smaller pipe to a larger one. { ri'düs·iŋ ˌkəp·liŋ }

reduction gear [MECH ENG] A gear train which lowers the output speed. { ri'dək·shən ˌgir }

reduction ratio [ENG] Ratio of feed size to product size for a mill (crushing or grinding) operation; measured by lump and sieve sizes. { ri'dək·shən ˌrā·shō }

reduction to sea level [ENG] The application of a correction to a measured horizontal length on the earth's surface, at any altitude, to reduce it to its projected or corresponding length at sea level. { ri'dək·shən tə 'sē ˌlev·əl }

redundancy [MECH] A statically indeterminate structure. { ri'dən·dən·sē }

redundant system *See* duplexed system. { ri'dən·dənt ˌsis·təm }

Redwood viscometer [ENG] A standard British-type viscometer in which the viscosity is determined by the time, in seconds, required for a certain quantity of liquid to pass out through the orifice under given conditions; used for determining viscosities of petroleum oils. { 'red ˌwůd vi'säm·əd·ər }

reed [ENG] A thin bar of metal, wood, or cane that is clamped at one end and set into transverse elastic vibration, usually by wind pressure; used to generate sound in musical instruments, and as a frequency standard, as in a vibrating-reed frequency meter. { rēd }

reed frequency meter *See* vibrating-reed frequency meter. { 'rēd 'frē·kwən·sē ˌmēd·ər }

reed horn [ENG ACOUS] A horn that produces sound by means of a steel reed vibrated by air under pressure. { 'rēd ˌhȯrn }

reeding [ENG] Corrugating or serrating, as in coining or embossing. { 'rēd·iŋ }

reel [DES ENG] A revolving spool-shaped device used for storage of hose, rope, cable, wire, magnetic tape, and so on. { rēl }

reel and bead *See* bead and reel. { 'rēl ən 'bēd }

reengineering [SYS ENG] The application of technology and management science to the modification of existing systems, organizations, processes, and products in order to make them more effective, efficient, and responsive. { ˌrē·en·jə'nir·iŋ }

reentrant [ENG] Having one or more sections directed inward, as in certain types of cavity resonators. { rē'en·trənt }

reference dimension [DES ENG] In dimensioning, a dimension without tolerance used for informational purposes only, and does not govern machining operations in any way; it is indicated on a drawing by writing the abbreviation REF directly following or under the dimension. { 'ref·rəns diˌmen·shən }

reference level [ENG] *See* datum plane. [ENG ACOUS] The level used as a basis of comparison when designating the level of an audio-frequency signal in decibels or volume units. Also known as reference signal level. { 'ref·rəns ˌlev·əl }

reference lot [IND ENG] A lot of select components, used as a standard. { 'ref·rəns ˌlät }

reference plane [ENG] *See* datum plane. [MECH ENG] The plane containing the axis and the cutting point of a cutter. { 'ref·rəns ˌplān }

reference range [ENG] Range obtained from the radar coverage indicator for a given penetrating aircraft. { 'ref·rəns ˌrānj }

reference seismometer [ENG] In seismic prospecting, a detector placed to record successive shots under similar conditions, to permit overall time comparisons. { 'ref·rəns sīz'mäm·əd·ər }

reference signal level *See* reference level. { 'ref·rəns 'sig·nəl ˌlev·əl }

reference tone [ENG] Stable tone of known frequency continuously recorded on one track of multitrack signal recordings and intermittently recorded on signal track recordings by the collection equipment operators for subsequent use by the data analysts as a frequency reference. { 'ref·rəns ˌtōn }

reference voltage [ELEC] An alternating-current voltage used for comparison, usually to identify an in-phase or out-of-phase condition in an ac circuit. { 'ref·rəns ˌvōl·tij }

referencing [ENG] The process of measuring the horizontal (or slope) distances and directions from a survey station to nearby landmarks, reference marks, and other permanent objects which can be used in the recovery or relocation of the station. { 'ref·rən·siŋ }

refine [ENG] To free from impurities, as the separation of petroleum, ores, or chemical mixtures into their component parts. { ri'fīn }

refinery [CHEM ENG] System of process units used to convert crude petroleum into fuels, lubricants, and other petroleum-derived products. { ri'fīn·rē }

reflectance *See* reflection factor. { ri'flek·təns }

reflected signal indicator [ENG] Pen recorder which presents the radar signals within frequency gates; these recordings enable the operator to determine that an airborne object has penetrated the Doppler link and its direction of penetration. { ri'flek·təd ¦sig·nəl 'in·dəˌkād·ər }

reflecting nephoscope *See* mirror nephoscope. { ri'flek·tiŋ 'nef·əˌskōp }

reflecting sign [CIV ENG] A road sign painted with reflective paint so as to be easily visible in the light of a headlamp. { ri'flek·tiŋ 'sīn }

reflection altimeter *See* radio altimeter. { ri'flek·shən al'tim·əd·ər }

reflection factor [ELEC] Ratio of the load current that is delivered to a particular load when the impedances are mismatched to that delivered under conditions of matched impedances. Also known as mismatch factor; reflectance; transition factor. { ri'flek·shən ˌfak·tər }

reflection goniometer [ENG] A goniometer that measures the angles between crystal faces by reflection of a parallel beam of light from successive crystal faces. { ri'flek·shən ˌgō·nē'äm·əd·ər }

reflection loss [ELEC] **1.** Reciprocal of the ratio, expressed in decibels, of the scalar values of the volt-amperes delivered to the load to the volt-amperes that would be delivered to a load of the same impedance as the source. **2.** Apparent transmission loss of a line which results from a portion of the energy being reflected toward the source due to a discontinuity in the transmission line. { ri'flek·shən ˌlós }

reflection profile [ENG] A seismic profile obtained by designing the spread geometry in such a manner as to enhance reflected energy. { ri 'flek·shən ˌprōˌfīl }

reflection seismology *See* reflection shooting. { ri'flek·shən sīz'mäl·ə·jē }

reflection shooting [ENG] A procedure in seismic prospecting based on the measurement of the travel times of waves which, originating from an artificially produced disturbance, have been reflected to detectors from subsurface boundaries separating media of different elastic-wave velocities; used primarily for oil and gas exploration. Also known as reflection seismology. { ri'flek·shən ˌshüd·iŋ }

reflection survey [ENG] Study of the presence, depth, and configuration of underground formations; a ground-level explosive charge (shot) generates vibratory energy (seismic rays) that strike formation interfaces and are reflected back to ground-level sensors. Also known as seismic survey. { ri'flek·shən ˌsərˌvā }

reflection x-ray microscopy [ENG] A technique for producing enlarged images in which a beam of x-rays is successively reflected at grazing incidence, from two crossed cylindrical surfaces; resolution is about 0.5–1 micrometer. { ri'flek·shən ¦eksˌrā mi'kräs·kə·pē }

reflectometer [ENG] A photoelectric instrument for measuring the optical reflectance of a reflecting surface. { ˌrēˌflek'täm·əd·ər }

reflector microphone [ENG ACOUS] A highly directional microphone which has a surface that reflects the rays of impinging sound from a given direction to a common point at which a microphone is located, and the sound waves in the speech-frequency range are in phase at the microphone. { ri'flek·tər ˌmī·krəˌfōn }

reflex baffle [ENG ACOUS] A loudspeaker baffle in which a portion of the radiation from the rear of the diaphragm is propagated forward after controlled shift of phase or other modification, to increase the overall radiation in some portion of the audio-frequency spectrum. Also known as vented baffle. { 'rēˌfleks ˌbaf·əl }

reflowing [ENG] Melting and resolidifying an electrodeposited or other type coating. { rē 'flō·iŋ }

reflux [CHEM ENG] In a chemical process, that part of the product stream that may be returned to the process to assist in giving increased conversion or recovery, as in distillation or liquid-liquid extraction. { 'rēˌfləks }

reflux condenser [CHEM ENG] An auxiliary vessel for a distillation column that constantly condenses vapors and returns liquid to the column. { 'rēˌfləks kənˌden·sər }

reflux ratio [CHEM ENG] The quantity of liquid reflux per unit quantity of product removed from the process unit, such as a distillation tower or extraction column. { 'rēˌfləks ˌrā·shō }

reforming [CHEM ENG] The thermal or catalytic

conversion of petroleum naphtha into more volatile products of higher octane number; represents the total effect of numerous simultaneous reactions, such as cracking, polymerization, dehydrogenation and isomerization. { ¦rē'fȯrm·iŋ }

refracting angle *See* apical angle. { ri'frak·tiŋ ˌaŋ·gəl }

refraction process [ENG] Seismic (reflection) survey in which the distance between the explosive shot and the receivers (sensors) is large with respect to the depths to be mapped. { ri'frak·shən ˌprā·səs }

refraction profile [ENG] A seismic profile obtained by designing the spread geometry in such a manner as to enhance refracted energy. { ri 'frak·shən ˌprō‚fīl }

refraction shooting [ENG] A type of seismic shooting based on the measurement of seismic energy as a function of time after the shot and of distance from the shot, by determining the arrival times of seismic waves which have traveled nearly parallel to the bedding in high-velocity layers, in order to map the depth of such layers. { ri'frak·shən ˌshüd·iŋ }

refractometer [ENG] An instrument used to measure the index of refraction of a substance in any one of several ways, such as measurement of the refraction produced by a prism, measurement of the critical angle, observation of an interference pattern produced by passing light through the substance, and measurement of the substance's dielectric constant. { ˌrē‚frak'täm·əd·ər }

refractory-lined firebox boiler [MECH ENG] A horizontal fire-tube boiler with the front portion of the shell located over a refractory furnace; the rear of the shell contains the first-pass tubes, and the second-pass tubes are located in the upper part of the shell. { ri'frak·trē ¦līnd 'fīr‚bäks ˌbȯil·ər }

refrigerated truck [MECH ENG] An insulated truck equipped and used as a refrigerator to transport fresh perishable or frozen products. { ri'frij·ə‚rād·əd 'trək }

refrigeration [MECH ENG] The cooling of a space or substance below the environmental temperature. { ri‚frij·ə'rā·shən }

refrigeration condenser [MECH ENG] A vapor condenser in a refrigeration system, where the refrigerant is liquefied and discharges its heat to the environment. { ri‚frij·ə'rā·shən kən ˌden·sər }

refrigeration cycle [THERMO] A sequence of thermodynamic processes whereby heat is withdrawn from a cold body and expelled to a hot body. { ri‚frij·ə'rā·shən ˌsī·kəl }

refrigeration system [MECH ENG] A closed-flow system in which a refrigerant is compressed, condensed, and expanded to produce cooling at a lower temperature level and rejection of heat at a higher temperature level for the purpose of extracting heat from a controlled space. { ri‚frij·ə'rā·shən ˌsis·təm }

refrigerator [MECH ENG] An insulated, cooled compartment. { ri'frij·ə‚rād·ər }

refrigerator car [MECH ENG] An insulated freight car constructed and used as a refrigerator. { ri'frij·ə‚rād·ər ˌkär }

regelation [THERMO] Phenomenon in which ice (or any substance which expands upon freezing) melts under intense pressure and freezes again when this pressure is removed; accounts for phenomena such as the slippery nature of ice and the motion of glaciers. { ¦rē·jə'lā·shən }

regenerate [CHEM ENG] To clean of impurities and make reusable as in regeneration of a catalytic cracking catalyst by burning off carbon residue, regeneration of clay adsorbent by washing free of adherents, or regeneration of a filtration system by cleaning off the filter media. [ELECTR] **1.** To restore pulses to their original shape. **2.** To restore stored information to its original form in a storage tube in order to counteract fading and disturbances. { rē'jen·ə‚rāt }

regeneration [CONT SYS] *See* positive feedback. [ELECTR] Replacement or restoration of charges in a charge storage tube to overcome decay effects, including loss of charge by reading. { rē‚jen·ə'rā·shən }

regeneration system [MECH ENG] A system within a gas turbine that recovers waste heat from the turbine exhaust and uses it for the compression cycle. { rē‚jen·ə'rā·shən ˌsis·təm }

regenerative air heater [MECH ENG] An air heater in which the heat-transferring members are alternately exposed to heat-surrendering gases and to air. { rē'jen·rəd·iv 'er ˌhēd·ər }

regenerative cooling [ENG] A method of cooling gases in which compressed gas is cooled by allowing it to expand through a nozzle, and the cooled expanded gas then passes through a heat exchanger where it further cools the incoming compressed gas. { rē'jen·rəd·iv 'kül·iŋ }

regenerative cycle [MECH ENG] *See* bleeding cycle. [THERMO] An engine cycle in which low-grade heat that would ordinarily be lost is used to improve the cyclic efficiency. { rē'jen·rəd·iv ˌsī·kəl }

regenerative feedback *See* positive feedback. { rē'jen·rəd·iv 'fēd‚bak }

regenerative pump [MECH ENG] Rotating-vane device that uses a combination of mechanical impulse and centrifugal force to produce high liquid heads at low volumes. Also known as turbine pump. { rē'jen·rəd·iv 'pəmp }

regenerator [CHEM ENG] Device or system used to return a system or a component of it to full strength in a chemical process; examples are a furnace to burn carbon from a catalyst, a tower to wash impurities from clay, and a flush system to clean off the surface of filter media. [ELECTR] **1.** A circuit that repeatedly supplies current to a display or memory device to prevent data from decaying. **2.** *See* repeater. [MECH ENG] A device used with hot-air engines and gas-burning furnaces which transfers heat from

effluent gases to incoming air or gas. { rē'jen·ə,rād·ər }

register [ENG] Also known as registration. **1.** The accurate matching or superimposition of two or more images, such as the three color images on the screen of a color television receiver, or the patterns on opposite sides of a printed circuit board, or the colors of a design on a printed sheet. **2.** The alignment of positions relative to a specified reference or coordinate, such as hole alignments in punched cards, or positioning of images in an optical character recognition device. [MECH ENG] The portion of a burner which directs the flow of air used in the combustion process. { 'rej·ə·stər }

register circuit [ELECTR] A switching circuit with memory elements that can store from a few to millions of bits of coded information; when needed, the information can be taken from the circuit in the same code as the input, or in a different code. { 'rej·ə·stər ˌsər·kət }

register control [CONT SYS] Automatic control of the position of a printed design with respect to reference marks or some other part of the design, as in photoelectric register control. { 'rej·ə·stər kənˌtrōl }

register mark [ENG] A mark or line printed or otherwise impressed on a web of material for use as a reference to maintain register. { 'rej·ə·stər ˌmark }

regular element [IND ENG] An element that occurs with a fixed frequency in each work cycle. Also known as repetitive element. { 'reg·yə·lər 'el·ə·mənt }

regular lay [DES ENG] The lay of a wire rope in which the wires in the strand are twisted in directions opposite to the direction of the strands. { 'reg·yə·lər 'lā }

regular-lay left twist *See* left-laid. { 'reg·yə·lər ˌlā 'left 'twist }

regulating reservoir [CIV ENG] A reservoir that regulates the flow in a water-distributing system. { 'reg·yəˌlād·iŋ 'rez·əvˌwär }

regulating system *See* automatic control system. { 'reg·yəˌlād·iŋ ˌsis·təm }

regulation [CONT SYS] The process of holding constant a quantity such as speed, temperature, voltage, or position by means of an electronic or other system that automatically corrects errors by feeding back into the system the condition being regulated; regulation thus is based on feedback, whereas control is not. [ELEC] The change in output voltage that occurs between no load and full load in a transformer, generator, or other source. [ELECTR] The difference between the maximum and minimum tube voltage drops within a specified range of anode current in a gas tube. { ˌreg·yə'lā·shən }

regulator [CONT SYS] A device that maintains a desired quantity at a predetermined value or varies it according to a predetermined plan. { 'reg·yəˌlād·ər }

regulator problem *See* linear regulator problem. { 'reg·yəˌlād·ər ˌpräb·ləm }

regulatory control function [CONT SYS] That level in the functional decomposition of a large-scale control system which interfaces with the plant to implement the decisions of the optimizing controller inputted in the form of set points, desired trajectories, or targets. Also known as direct control function. { 'reg·yə·ləˌtȯr·ē kən'trōl ˌfəŋk·shən }

rehabilitation engineering [ENG] The use of technology to make disabled persons as independent as possible by providing assistive devices to compensate for disability. { ˌrē·əˌbil·ə'tā·shən ˌen·jəˌnir·iŋ }

reheating [THERMO] A process in which the gas or steam is reheated after a partial isentropic expansion to reduce moisture content. Also known as resuperheating. { rē'hēd·iŋ }

Reich process [CHEM ENG] Process to purify carbon dioxide produced during fermentation; organic impurities in the gas are oxidized and absorbed, then the gas is dehydrated. { 'rīk ˌprä·səs }

Reid vapor pressure [ENG] A measure in a test bomb of the vapor pressure in pounds pressure of a sample of gasoline at 100°F (37.8°C). { 'rēd 'vā·pər ˌpresh·ər }

reinforced beam [CIV ENG] A concrete beam provided with steel bars for longitudinal tension reinforcement and sometimes compression reinforcement and reinforcement against diagonal tension. { ˌrē·ən'fȯrst 'bēm }

reinforced brickwork [CIV ENG] Brickwork strengthened by expanded metal, steel-wire mesh, hoop iron, or thin rods embedded in the bed joints. { ˌrē·ən'fȯrst 'brikˌwərk }

reinforced column [CIV ENG] **1.** A long concrete column reinforced with longitudinal bars with ties or circular spirals. **2.** A composite column. **3.** A combination column. { ˌrē·ən'fȯrst 'käl·əm }

reinforced concrete [CIV ENG] Concrete containing reinforcing steel rods or wire mesh. { ˌrē·ən'fȯrst 'kän,krēt }

reinforcement [CIV ENG] Strengthening concrete, plaster, or mortar by embedding steel rods or wire mesh in it. { ˌrē·ən'fȯrs·mənt }

reinforcing bars [CIV ENG] Steel rods that are embedded in building materials such as concrete for reinforcement. { ˌrē·ən'fȯrs·iŋ ˌbärz }

rejection number [IND ENG] A predetermined number of defective items in a batch which, if not exceeded, requires acceptance of the batch. { ri'jek·shən ˌnəm·bər }

rejector circuit *See* band-stop filter. { ri'jek·tər ˌsər·kət }

relative compaction [ENG] The percentage ratio of the field density of soil to the maximum density as determined by standard compaction. { 'rel·əd·iv kəm'pak·shən }

relative density *See* specific gravity. { 'rel·əd·iv 'den·səd·ē }

relative-density bottle *See* specific-gravity bottle. { 'rel·əd·iv ˌden·səd·ē ˌbäd·əl }

relative dielectric constant *See* dielectric constant. { 'rel·əd·iv ˌdī·i'lek·trik 'kän·stənt }

relative force [ENG] Ratio of the force of a test

propellant to the force of a standard propellant, measured at the same initial temperature and loading density in the same closed chamber. { 'rel·əd·iv 'fȯrs }

relative gain array [CONT SYS] An analytical device used in process control multivariable applications, based on the comparison of single-loop control to multivariable control; expressed as an array (for all possible input-output pairs) of the ratios of a measure of the single-loop behavior between an input-output variable pair, to a related measure of the behavior of the same input-output pair under some idealization of multivariable control. { 'rel·əd·iv ˈgān ə,rā }

relative gravity instrument [ENG] Any device for measuring the differences in the gravity force or acceleration at two or more points. { 'rel·əd·iv 'grav·əd·ē ˌin·strə·mənt }

relative interference effect [ENG ACOUS] Of a single-frequency electric wave in an electroacoustic system, the ratio, usually expressed in decibels, of the amplitude of a wave of specified reference frequency to that of the wave in question when the two waves are equal in interference effects. { 'rel·əd·iv ˌin·tər'fir·ənz i,fekt }

relative ionospheric opacity meter *See* riometer. { 'rel·əd·iv ˌī˞ən·ə˞sfir·ik ō'pas·əd·ē ˌmēd·ər }

relative magnetometer [ENG] Any magnetometer which must be calibrated by measuring the intensity of a field whose strength is accurately determined by other means; opposed to absolute magnetometer. { 'rel·əd·iv ˌmag·nə'täm·əd·ər }

relative momentum [MECH] The momentum of a body in a reference frame in which another specified body is fixed. { 'rel·əd·iv mə'men·təm }

relative motion [MECH] The continuous change of position of a body with respect to a second body or to a reference point that is fixed. Also known as apparent motion. { 'rel·əd·iv 'mō·shən }

relative permittivity *See* dielectric constant. { 'rel·əd·iv ˌpər·mə'tiv·əd·ē }

relative pressure response [ENG ACOUS] The amount, in decibels, by which the acoustic pressure induced by a projector under some specified condition exceeds the pressure induced under a reference condition. { 'rel·əd·iv ˈpresh·ər ri ˌspäns }

relative resistance [ELEC] The ratio of the resistance of a piece of a material to the resistance of a piece of specified material, such as annealed copper, having the same dimensions and temperature. { 'rel·əd·iv ri'zis·təns }

relative transmitting response [ENG ACOUS] In a sonar projector, the ratio of the transmitting response for a given bearing and frequency to the transmitting response for a specified bearing and frequency. { 'rel·əd·iv tranz'mid·iŋ ri ˌspäns }

relative velocity [MECH] The velocity of a body with respect to a second body; that is, its velocity in a reference frame where the second body is fixed. { 'rel·əd·iv və'läs·əd·ē }

relaxation [MECH] **1.** Relief of stress in a strained material due to creep. **2.** The lessening of elastic resistance in an elastic medium under an applied stress resulting in permanent deformation. { ˌrē,lak'sā·shən }

relaxation circuit [ELECTR] Circuit arrangement, usually of vacuum tubes, reactances, and resistances, which has two states or conditions, one, both, or neither of which may be stable; the transient voltage produced by passing from one to the other, or the voltage in a state of rest, can be used in other circuits. { ˌrē,lak'sā·shən ˌsər·kət }

relaxation test [ENG] A creep test in which the decrease of stress with time is measured while the total strain (elastic and plastic) is maintained constant. { ˌrē,lak'sā·shən ˌtest }

relay [ELEC] A device that is operated by a variation in the conditions in one electric circuit and serves to make or break one or more connections in the same or another electric circuit. Also known as electric relay. { 'rē,lā }

relay control system [CONT SYS] A control system in which the error signal must reach a certain value before the controller reacts to it, so that the control action is discontinuous in amplitude. { 'rē,lā kən'trōl ˌsis·təm }

relay rack [DES ENG] A standardized steel rack designed to hold 19-inch (48.26-centimeter) panels of various heights, on which are mounted radio receivers, amplifiers, and other units of electronic equipment. Also known as rack. { 'rē,lā ˌrak }

relay system [ELEC] Dial-switching equipment that does not use mechanical switches, but is made up principally of relays. { 'rē,lā ˌsis·təm }

release [MECH ENG] A mechanical arrangment of parts for holding or freeing a device or mechanism as required. { ri'lēs }

release adiabat [MECH] A curve or locus of points which defines the succession of states through which a mass that has been shocked to a high-pressure state passes while monotonically returning to zero pressure. { ri'lēs 'ad·ē·ə,bat }

reliability [ENG] The probability that a component part, equipment, or system will satisfactorily perform its intended function under given circumstances, such as environmental conditions, limitations as to operating time, and frequency and thoroughness of maintenance for a specified period of time. { ri,lī·ə'bil·əd·ē }

relief [MECH ENG] **1.** A passage made by cutting away one side of a tailstock center so that the facing or parting tool may be advanced to or almost to the center of the work. **2.** Clearance provided around the cutting edge by removal of tool material. { ri'lēf }

relief angle [MECH ENG] The angle between a relieved surface and a tangential plane at a cutting edge. { ri'lēf ˌaŋ·gəl }

relief frame [MECH ENG] A frame placed between the slide valve of a steam engine and the steam chest cover; reduces pressure on the valve and thereby reduces friction. { ri'lēf ˌfrām }

relief hole [ENG] Any of the holes fired after the

cut holes and before the lifter holes in breaking ground for tunneling or shaft sinking. { ri'lēf ˌhōl }

relief valve *See* pressure-relief valve. { ri'lēf ˌvalv }

relief well [CIV ENG] A well that drains a pervious stratum, to relieve waterlogging at the surface. { ri'lēf ˌwel }

relieving [MECH ENG] Treating an embossed metal surface with an abrasive to reveal the base-metal color on the elevations or highlights of the surface. { ri'lēv·iŋ }

relieving arch *See* discharging arch. { ri'lēv·iŋ ˌärch }

relieving platform [CIV ENG] A deck on the land side of a retaining wall to transfer loads vertically down to the wall. { ri'lēv·iŋ ˌplatˌfȯrm }

relish [ENG] The shoulder of a tenon, used in a mortise and tenon system. { 'rel·ish }

reluctance microphone *See* magnetic microphone. { ri'lək·təns ˌmī·krəˌfōn }

reluctance pickup *See* variable-reluctance pickup. { ri'lək·təns ˌpikˌəp }

reluctance pressure transducer [ENG] Pressure-measurement transducer in which pressure changes activate equivalent magnetic-property changes. { ri'lək·təns 'presh·ər tranzˌdü·sər }

remaining velocity [MECH] Speed of a projectile at any point along its path of fire. { ri'mān·iŋ vəˈläs·əd·ē }

remedial operation [CHEM ENG] In a chemical process operation, the revision of operating conditions so as to correct the overall operation and bring the product into desired rote or specification limits. Also known as corrective operation. { ri'mēd·ē·əl ˌäp·əˈrā·shən }

remote-access admittance [CONT SYS] A special piece of hardware, with built-in sensors and actuators, that is used by a robot to carry out the last stages of assembling several parts into a piece of equipment. { ri'mōt ¦akˌses adˈmit·əns }

remote-center compliance [MECH ENG] A compliant device that allows a part that is gripped by a robot or other automatic machinery to rotate about the tip of the robot end effector or to translate without rotation when it is pushed, thereby easing the mechanical assembly of parts. { ri'mōt ¦sen·tər kəmˈplī·əns }

remote control [CONT SYS] Control of a quantity which is separated by an appreciable distance from the controlling quantity; examples include master-slave manipulators, telemetering, telephone, and television. { ri'mōt kən 'trōl }

remote manipulation [ENG] Use of mechanical equipment controlled from a distance to handle materials, such as radioactive materials. Also known as teleoperation. { ri'mōt məˌnip·yə 'lā·shən }

remote manipulator [ENG] A mechanical, electromechanical, or hydromechanical device that enables a person, directly controlling the device through handles or switches, to perform manual operations while separated from the site of the work. Also known as manipulator; teleoperator. { ri'mōt məˈnip·yəˌlād·ər }

remote metering *See* telemetering. { ri'mōt 'mēd·ə·riŋ }

remote sensing [ELEC] Sensing, by a power supply, of voltage directly at the load, so that variations in the load lead drop do not affect load regulation. [ENG] The gathering and recording of information without actual contact with the object or area being investigated. { ri 'mōt 'sens·iŋ }

renewable energy source [ENG] A form of energy that is constantly and rapidly renewed by natural processes such as solar, ocean wave, and wind energy. { riˌnü·ə·bəl 'en·ər·jē ˌsȯrs }

renewable resources [CHEM ENG] Agricultural materials used as feedstocks for industrial processes. { riˈnü·ə·bəl riˈsȯr·səs }

reorder cycle [IND ENG] The interval between successive reorder (procurement) actions. { reˈȯr·dər ˌsī·kəl }

reorder point [IND ENG] An arbitrary level of stock on hand plus stock due in, at or below which routine requisitions for replenishment purposes are submitted in accordance with established requisitioning schedules. { reˈȯr·dər ˌpȯint }

repair [ENG] To restore that which is unserviceable to a serviceable condition by replacement of parts, components, or assemblies. { ri'per }

repair cycle [ENG] The period that elapses from the time the item is removed in a reparable condition to the time it is returned to stock in a serviceable condition. { ri'per ˌsī·kəl }

repair dock [CIV ENG] A graving dock or floating dry dock built primarily for ship repair. { ri'per ˌdäk }

repair forecast [ENG] The quantity of items estimated to be repaired or rebuilt for issue during a stated future period. { ri'per ˌfōrˌkast }

repair kit [ENG] A group of parts and tools, not all having the same basic name, used for repair or replacement of the worn or broken parts of an item; it may include instruction sheets and material, such as sandpaper, tape, cement, gaskets, and the like. { ri'per ˌkit }

repair parts list [ENG] List approved by designated authorities, indicating the total quantities of repair parts, tools, and equipment necessary for the maintenance of a specified number of end items for a definite period of time. { ri'per ¦pärts ˌlist }

repeatability [CONT SYS] The ability of a robot to reposition itself at a location to which it is directed or at which it is commanded to stop. { riˌpēd·əˈbil·əd·ē }

repeat accuracy [CONT SYS] The variations in the actual position of a robot manipulator from one cycle to the next when the manipulator is commanded to repeatedly return to the same point or position. { ri'pēt 'ak·yə·rə·sē }

repeated load [MECH] A force applied repeatedly, causing variation in the magnitude and sometimes in the sense, of the internal forces. { ri'pēd·əd 'lōd }

repeater [ELEC] *See* repeating coil. [ELECTR] **1.** An amplifier or other device that receives weak signals and delivers corresponding stronger signals with or without reshaping of waveforms; may be either a one-way or two-way repeater. Also known as regenerator. **2.** An indicator that shows the same information as is shown on a master indicator. Also known as remote indicator. { ri'pēd·ər }

repeater jammer [ELECTR] A jammer that intercepts an enemy radar signal and reradiates the signal after modifying it to incorporate erroneous data on azimuth, range, or number of targets. { ri'pēd·ər ˌjam·ər }

repeating coil [ELEC] A transformer used to provide inductive coupling between two sections of a telephone line when a direct connection is undesirable. Also known as repeater. { ri 'pēd·iŋ ˌkȯil }

repeating-coil bridge cord [ELEC] In telephony, a method of connecting the common office battery to the cord circuits by connecting the battery to the midpoints of a repeating coil, bridged across the cord circuit. { ri'pēd·iŋ ˈkȯil 'brij ˌkȯrd }

repeller [ELECTR] An electrode whose primary function is to reverse the direction of an electron stream in an electron tube. Also known as reflector. { ri'pel·ər }

repetitive element *See* regular element. { rə'ped·əd·iv 'el·ə·mənt }

repetitive time method [IND ENG] A technique where the stopwatch is read and simultaneously returned to zero at each break point. Also known as snapback method. { ri'ped·əd·iv 'tīm ˌmeth·əd }

replacement bit *See* reset bit. { ri'plās·mənt ˌbit }

replacement demand [ENG] A demand representing replacement of items consumed or worn out. { ri'plās·mənt di‚mand }

replacement factor [ENG] The estimated percentage of equipment or repair parts in use that will require replacement during a given period. { ri'plās·mənt ˌfak·tər }

replacement study [IND ENG] An economic analysis involving the comparison of an existing facility and a proposed replacement facility. { ri'plās·mənt ˌstəd·ē }

replica [ENG] A thin plastic or inorganic film which is formed on a surface and then removed from it for study in an electron microscope. { 'rep·lə·kə }

replica master [MECH ENG] A robotlike machine whose motions are duplicated by another robot when the machine is moved by a human operator. { 'rep·lə·kə ˌmas·tər }

Reppe process [CHEM ENG] A family of high-pressure, catalytic acetylene-reaction processes yielding (depending upon what the acetylene reacts with) butadiene, allyl alcohol, acrylonitrile, vinyl ethers and derivatives, acrylic acid esters, cyclooctatraene, and resins. { 'rep·ə ˌprä·səs }

reproducing stylus *See* stylus. { ˌrē·prəˈdüs·iŋ ˌstī·ləs }

reproducing system *See* sound-reproducing system. { ˌrē·prəˈdüs·iŋ ˌsis·təm }

repulsion [MECH] A force which tends to increase the distance between two bodies having like electric charges, or the force between atoms or molecules at very short distances which keeps them apart. Also known as repulsive force. { ri'pəl·shən }

repulsive force *See* repulsion. { ri'pəl·siv 'fȯrs }

required thickness [DES ENG] The thickness calculated by recognized formulas for boiler or pressure vessel construction before corrosion allowance is added. { ri'kwīrd 'thik·nəs }

requirements engineering [SYS ENG] The process of identifying and articulating needs for a new technology and applications. { riˈkwīr·mənz ˌen·jəˈnir·iŋ }

rerailer [ENG] A small, lightweight Y-shaped device, used to retrack railroad cars and locomotives; as the car is pulled across the device, the derailed wheels are channeled back onto the tracks. Also known as retracker. { rē'rāl·ər }

rerun [CHEM ENG] To distill a liquid material that has already been distilled; usually implies taking a large proportion of the charge stock overhead. { 'rēˌrən }

resaw [ENG] To cut lumber to boards of final thickness. { rē'sȯ }

resealing pressure [MECH ENG] The inlet pressure at which leakage stops after a pressure relief valve is closed. { rē'sēl·iŋ ˌpresh·ər }

research method [ENG] A standard test to determine the research octane number (or rating) of fuels for use in spark-ignition engines. { ri'sərch ˌmeth·əd }

research octane number [ENG] An expression for the antiknock rating of a motor gasoline as a guide to how vehicles will operate under mild conditions associated with low engine speeds. { ri'sərch 'äkˌtān ˌnəm·bər }

resection [ENG] **1.** A method in surveying by which the horizontal position of an occupied point is determined by drawing lines from the point to two or more points of known position. **2.** A method of determining a plane-table position by orienting along a previously drawn foresight line and drawing one or more rays through the foresight from previously located stations. { ri'sek·shən }

reservoir [CIV ENG] A pond or lake built for storage of water, usually by the construction of a dam across a river. { 'rez·əvˌwär }

reset action [CONT SYS] Floating action in which the final control element is moved at a speed proportional to the extent of proportional-position action. { 'rēˌset ˌak·shən }

reset bit [DES ENG] A diamond bit made by reusing diamonds salvaged from a used bit and setting them in the crown attached to a new bit blank. Also known as replacement bit. { 'rē ˌset bit }

reset rate [ENG] The number of times per minute that the effect of the proportional-position action upon the final control element is repeated

by the proportional-speed floating action. { 'rē ˌset ˌrāt }

residence time [CHEM ENG] The average length of time a particle of reactant spends within a process vessel or in contact with a catalyst. { 'rez·ə·dəns ˌtīm }

residual mode [CONT SYS] A characteristic motion of a structure which is deliberately ignored in the control algorithm of an active control system for the structure in the process of model reduction. { rə'zij·ə·wəl ˌmōd }

residual stress *See* internal stress. { rə'zij·ə·wəl 'stres }

residue [CHEM ENG] **1.** The substance left after distilling off all but the heaviest components from crude oil in petroleum refinery operations. Also known as bottoms; residuum. **2.** Solids deposited onto the filter medium during filtration. Also known as cake; discharged solids. { 'rez·əˌdü }

residuum *See* residue. { rə'zij·ə·wəm }

resilience [MECH] **1.** Ability of a strained body, by virtue of high yield strength and low elastic modulus, to recover its size and form following deformation. **2.** The work done in deforming a body to some predetermined limit, such as its elastic limit or breaking point, divided by the body's volume. { rə'zil·yəns }

resin-in-pulp ion exchange [CHEM ENG] Combination of coarse anion-exchange resin with a slurry of finely ground uranium ore in an acid-leach liquor. { 'rez·ən in 'pəlp ˈīˌän iksˌchānj }

resinoid wheel [DES ENG] A grinding wheel bonded with a synthetic resin. { 'rez·ənˌóid 'wēl }

resistance [ELEC] **1.** The opposition that a device or material offers to the flow of direct current, equal to the voltage drop across the element divided by the current through the element. Also known as electrical resistance. **2.** In an alternating-current circuit, the real part of the complex impedance. [MECH] In damped harmonic motion, the ratio of the frictional resistive force to the speed. Also known as damping coefficient; damping constant; mechanical resistance. { ri'zis·təns }

resistance bridge *See* Wheatstone bridge. { ri'zis·təns ˌbrij }

resistance-capacitance circuit [ELEC] A circuit which has a resistance and a capacitance in series, and in which inductance is negligible. Abbreviated R-C circuit. { ri'zis·təns kə'pas·əd·əns ˌsər·kət }

resistance-capacitance coupled amplifier [ELECTR] An amplifier in which a capacitor provides a path for signal currents from one stage to the next, with resistors connected from each side of the capacitor to the power supply or to ground; it can amplify alternating-current signals but cannot handle small changes in direct currents. Also known as R-C amplifier; R-C coupled amplifier; resistance-coupled amplifier. { ri'zis·təns kə'pas·əd·əns ¦kəp·əld 'am·pləˌfī·ər }

resistance-capacitance oscillator [ELECTR] Oscillator in which the frequency is determined by resistance and capacitance elements. Abbreviated R-C oscillator. { ri'zis·təns kə'pas·əd·əns 'äs·əˌlād·ər }

resistance-coupled amplifier *See* resistance-capacitance coupled amplifier. { ri'zis·təns ¦kəp·əld 'am·pləˌfī·ər }

resistance coupling [ELECTR] Coupling in which resistors are used as the input and output impedances of the circuits being coupled; a coupling capacitor is generally used between the resistors to transfer the signal from one stage to the next. Also known as R-C coupling; resistance-capacitance coupling; resistive coupling. { ri'zis·təns ˌkəp·liŋ }

resistance drop [ELEC] The voltage drop occurring between two points on a conductor due to the flow of current through the resistance of the conductor; multiplying the resistance in ohms by the current in amperes gives the voltage drop in volts. Also known as IR drop. { ri'zis·təns ˌdräp }

resistance element [ELEC] An element of resistive material in the form of a grid, ribbon, or wire, used singly or built into groups to form a resistor for heating purposes, as in an electric soldering iron. { ri'zis·təns ˌel·ə·mənt }

resistance furnace [ENG] An electric furnace in which the heat is developed by the passage of current through a suitable internal resistance that may be the charge itself, a resistor embedded in the charge, or a resistor surrounding the charge. Also known as electric resistance furnace. { ri'zis·təns ˌfər·nəs }

resistance gage [ENG] An instrument for determining high pressures from the change in the electrical resistance of manganin or mercury produced by these pressures. { ri'zis·təns ˌgāj }

resistance grounding [ELEC] Electrical grounding in which lines are connected to ground by a resistive (totally dissipative) impedance. { ri'zis·təns ˌgraünd·iŋ }

resistance heating [ELEC] The generation of heat by electric conductors carrying current; degree of heating is proportional to the electrical resistance of the conductor; used in electrical home appliances, home or space heating, and heating ovens and furnaces. { ri'zis·təns ˌhēd·iŋ }

resistance loss [ELEC] Power loss due to current flowing through resistance; its value in watts is equal to the resistance in ohms multiplied by the square of the current in amperes. { ri'zis·təns ˌlós }

resistance magnetometer [ENG] A magnetometer that depends for its operation on variations in the electrical resistance of a material immersed in the magnetic field to be measured. { ri'zis·təns ˌmag·nə'täm·əd·ər }

resistance material [ELEC] Material having sufficiently high resistance per unit length or volume to permit its use in the construction of resistors. { ri'zis·təns mə'tir·ē·əl }

resistance measurement [ELEC] The quantitative determination of that property of an electrically conductive material, component, or circuit

called electrical resistance. { ri'zis·təns ˌmezh·ər·mənt }

resistance meter [ENG] Any instrument which measures electrical resistance. Also known as electrical resistance meter. { ri'zis·təns ˌmēd·ər }

resistance methanometer [ENG] A catalytic methanometer, with platinum used as the filament, which both heats the detecting element and acts as a resistance-type thermometer. { ri'zis·təns ˌmeth·ə'näm·əd·ər }

resistance pyrometer *See* resistance thermometer. { ri'zis·təns pī'räm·əd·ər }

resistance-rate flowmeter *See* resistive flowmeter. { ri'zis·təns ˈrāt 'flōˌmēd·ər }

resistance thermometer [ENG] A thermometer in which the sensing element is a resistor whose resistance is an accurately known function of temperature. Also known as electrical resistance thermometer; resistance pyrometer. { ri 'zis·təns thər'mäm·əd·ər }

resisting moment [MECH] A moment produced by internal tensile and compressive forces that balances the external bending moment on a beam. { ri'zist·iŋ ˌmō·mənt }

resistive coupling *See* resistance coupling. { ri 'zis·tiv 'kəp·liŋ }

resistive flowmeter [ENG] Liquid flow-rate measurement device in which flow rates are read electrically as the result of the rise or fall of a conductive differential-pressure manometer fluid in contact with a resistance-rod assembly. Also known as resistance-rate flowmeter. { ri'zis·tiv 'flōˌmēd·ər }

resistive load [ELEC] A load whose total reactance is zero, so that the alternating current is in phase with the terminal voltage. Also known as nonreactive load. { ri'zis·tiv 'lōd }

resistivity *See* electrical resistivity. { ˌrēˌzis'tiv·əd·ē }

resistivity method [ENG] Any electrical exploration method in which current is introduced in the ground by two contact electrodes and potential differences are measured between two or more other electrodes. { ˌrēˌzis'tiv·əd·ē ˌmeth·əd }

resistor [ELEC] A device designed to have a definite amount of resistance; used in circuits to limit current flow or to provide a voltage drop. Also known as electrical resistor. { ri'zis·tər }

resistor bulb [ENG] A temperature-measurement device inside of which is a resistance winding; changes in temperature cause corresponding changes in resistance, varying the current in the winding. { ri'zis·tər ˌbəlb }

resistor-capacitor-transistor logic [ELECTR] A resistor-transistor logic with the addition of capacitors that are used to enhance switching speed. { ri'zis·tər kə'pas·əd·ər tran'zis·tər ˌläj·ik }

resistor-capacitor unit *See* rescap. { ri'zis·tər kə'pas·əd·ər ˌyü·nət }

resistor color code [ELEC] Code adopted by the Electronic Industries Association to mark the values of resistance on resistors in a readily recognizable manner; the first color represents the first significant figure of the resistor value, the second color the second significant figure, and the third color represents the number of zeros following the first two figures; a fourth color is sometimes added to indicate the tolerance of the resistor. { ri'zis·tər 'kəl·ər ˌkōd }

resistor core [ELEC] Insulating support on which a resistor element is wound or otherwise placed. { ri'zis·tər ˌkȯr }

resistor element [ELEC] That portion of a resistor which possesses the property of electric resistance. { ri'zis·tər ˌel·ə·mənt }

resistor furnace [ENG] An electric furnace in which heat is developed by the passage of current through distributed resistors (heating units) mounted apart from the charge. { ri'zis·tər ˌfər·nəs }

resistor network [ELEC] An electrical network consisting entirely of resistances. { ri'zis·tər 'netˌwərk }

resistor oven [ENG] Heating chamber relying on an electrical-resistance element to create temperatures of up to 800°F (430°C); used for drying and baking. { ri'zis·tər 'əv·ən }

resistor termination [ELECTR] A thick-film conductor pad overlapping and contacting a thick-film resistor area. { ri'zis·tər ˌtər·mə'nā·shən }

resistor-transistor logic [ELECTR] One of the simplest logic circuits, having several resistors, a transistor, and a diode. Abbreviated RTL. { ri'zis·tər tran'zis·tər ˌläj·ik }

resolution [CONT SYS] The smallest increment in distance that can be distinguished and acted upon by an automatic control system. [ELECTR] In television, the maximum number of lines that can be discerned on the screen at a distance equal to tube height; this ranges from 350 to 400 for most receivers. { ˌrez·ə'lü·shən }

resolution in azimuth [ENG] The angle by which two targets must be separated in azimuth in order to be distinguished by a radar set when the targets are at the same range. { ˌrez·ə'lü·shən in 'az·ə·məth }

resolution in range [ENG] Distance by which two targets must be separated in range in order to be distinguished by a radar set when the targets are on the same azimuth line. { ˌrez·ə'lü·shən in 'rānj }

resolve motion-rate control [CONT SYS] A form of robotic control in which the controlled variables are the velocity vectors of the end points of a manipulator, and the angular velocities of the joints are determined to obtain the desired results. { ri'zolv 'mō·shən ˈrāt kənˌtrōl }

resolving power *See* resolution. { ri'zälv·iŋ ˌpaü·ər }

resolving time [ENG] Minimum time interval, between events, that can be detected; resolving time may refer to an electronic circuit, to a mechanical recording device, or to a counter tube. { ri'zälv·iŋ ˌtīm }

resonance [ELEC] A phenomenon exhibited by an alternating-current circuit in which there are relatively large currents near certain frequencies, and a relatively unimpeded oscillation of energy

from a potential to a kinetic form; a special case of the physics definition. { 'rez·ən·əns }

resonance method [ELEC] A method of determining the impedance of a circuit element, in which resonance frequency of a resonant circuit containing the element is measured. [ENG] In ultrasonic testing, a method of measuring the thickness of a metal by varying the frequency of the beam transmitted to excite a maximum amplitude of vibration. { 'rez·ən·əns ˌmeth·əd }

resonance vibration [MECH] Forced vibration in which the frequency of the disturbing force is very close to the natural frequency of the system, so that the amplitude of vibration is very large. { 'rez·ən·əns vī¦brā·shən }

resonant capacitor [ELEC] A tubular capacitor that is wound to have inductance in series with its capacitance. { 'res·ən·ənt kə'pas·əd·ər }

resonant circuit [ELEC] A circuit that contains inductance, capacitance, and resistance of such values as to give resonance at an operating frequency. { 'res·ən·ənt 'sər·kət }

resonant coupling [ELEC] Coupling between two circuits that reaches a sharp peak at a certain frequency. { 'res·ən·ənt 'kəp·liŋ }

resonant gate transistor [ELECTR] Surface field-effect transistor incorporating a cantilevered beam which resonates at a specific frequency to provide high-Q-frequency discrimination. { 'res·ən·ənt 'gāt tranˌzis·tər }

resonant-mass antenna [ENG] A detector of gravitational radiation, consisting of a mass of several tons of aluminum or other metal, in the shape of a cylinder or a truncated icosahedron, and attached electromechanical transducers that convert deformations of the mass to electronic signals. { ¦rez·ən·ənt ˌmas an'ten·ə }

resonant resistance [ELEC] Resistance value to which a resonant circuit is equivalent. { 'res·ən·ənt ri'zis·təns }

resource allocation in multiproject scheduling [IND ENG] A system that employs network analysis as an aid in making the best assignment of resources which must be stretched over a number of projects. Abbreviated RAMPS. { 'rē ˌsȯrs ˌal·ə'kā·shən in ¦məl·ti¦prä·jekt 'sked·jə·liŋ }

respirator [ENG] A device for maintaining artificial respiration to protect the respiratory tract against irritating and poisonous gases, fumes, smoke, and dusts, with or without equipment supplying oxygen or air; some types have a fitting which covers the nose and mouth. { 'res·pəˌrād·ər }

respirometer [ENG] **1.** An instrument for studying respiration. **2.** A diver's helmet containing a compressed air supply for replenishing oxygen used by the diver. { ˌres·pə'räm· əd·ər }

response [CONT SYS] A quantitative expression of the output of a device or system as a function of the input. Also known as system response. { ri'späns }

response characteristic [CONT SYS] The response as a function of an independent variable, such as direction or frequency, often presented in graphical form. { ri'späns ˌkar·ik·təˌris·tik }

response time [CONT SYS] The time required for the output of a control system or element to reach a specified fraction of its new value after application of a step input or disturbance. [ELEC] The time it takes for the pointer of an electrical or electronic instrument to come to rest at a new value, after the quantity it measures has been abruptly changed. { ri'späns ˌtīm }

restitution coefficient *See* coefficient of restitution. { ˌres·tə'tü·shən ˌkō·iˌfish·ənt }

rest point [ENG] On a balance, the position of the pointer with respect to the pointer scale when the beam has ceased moving. { 'rest ˌpoint }

rest potential [ELEC] Residual potential difference remaining between an electrode and an electrolyte after the electrode has become polarized. { 'rest pəˌten·chəl }

restraint of loads [ENG] The process of binding, lashing, and wedging items into one unit onto or into its transporter in a manner that will ensure immobility during transit. { ri'strānt əv 'lōdz }

restricted air cargo [IND ENG] Cargo which is not highly dangerous under normal conditions, but which possesses certain qualities which require extra precautions in packing and handling. { ri'strik·təd 'er ˌkär·gō }

restricted gate [ENG] Small opening between runner and cavity in an injection or transfer mold which breaks cleanly when the piece is ejected. { ri'strik·təd 'gāt }

restricted job [IND ENG] A task whose performance time is governed by a machine, a process, another task, or the nature of the job itself, rather than being under the control of the worker. { ri'strik·təd 'jäb }

restricted work [IND ENG] Manual or machine work where the work pace is only partially under the control of the worker. { ri'strik·təd 'wərk }

resultant of forces [MECH] A system of at most a single force and a single couple whose external effects on a rigid body are identical with the effects of the several actual forces that act on that body. { ri'zəlt·ənt əv 'fȯrs·əz }

resultant rake [MECH ENG] The angle between the face of a cutting tooth and an axial plane through the tooth point measured in a plane at right angles to the cutting edge. { ri'zəlt·ənt 'rāk }

resuperheating *See* reheating. { rē¦sü·pər'hēd·iŋ }

resupply [IND ENG] The act of replenishing stocks in order to maintain required levels of supply. { ¦rē·sə'plī }

resuscitator [ENG] A device for supplying oxygen to and inducing breathing in asphyxiation victims. { ri'səs·əˌtād·ər }

retainer [ENG] A device that holds a mechanical component in place. { ri'tān·ər }

retainer plate [ENG] The plate on which removable mold parts (such as a cavity or ejector pin) are mounted during molding. { ri'tān·ər ˌplāt }

retainer wall [ENG] A wall, usually earthen,

around a storage tank or an area of storage tanks (tank farm); used to hold (retain) liquid in place if one or more tanks begin to leak. { ri'tān·ər ˌwȯl }

retaining ring [DES ENG] **1.** A shoulder inside a reaming shell that prevents the core lifter from entering the core barrel. **2.** A steel ring between the races of a ball bearing to maintain the correct distribution of the balls in the races. { ri'tān·iŋ ˌriŋ }

retaining wall [CIV ENG] A wall designed to maintain differences in ground elevations by holding back a bank of material. { ri'tān·iŋ ˌwȯl }

retard [CIV ENG] A permeable bank-protection structure, situated at and parallel to the toe of a slope and projecting into a stream channel, designed to check stream velocity and induce silting or accretion. { ri'tärd }

retarder [MECH ENG] **1.** A braking device used to control the speed of railroad cars moving along the classification tracks in a hump yard. **2.** A strip inserted in a tube of a fire-tube boiler to increase agitation of the hot gases flowing therein. { ri 'tärd·ər }

retarding basin [CIV ENG] A basin designed and operated to provide temporary storage and thus reduce the peak flood flows of a stream. { ri 'tärd·iŋ ˌbās·ən }

retarding conveyor [MECH ENG] Any type of conveyor used to restrain the movement of bulk materials, packages, or objects where the incline is such that the conveyed material tends to propel the conveying medium. { ri'tärd·iŋ kən ˌvā·ər }

retort [CHEM ENG] **1.** A closed refractory chamber in which coal is carbonized for manufacture of coal gas. **2.** A vessel for the distillation or decomposition of a substance. { ri'tȯrt }

retreater [ENG] A defective maximum thermometer of the liquid-in-glass type in which the mercury flows too freely through the constriction; such a thermometer will indicate a maximum temperature that is too low. { ri'trēd·ər }

retrievable inner barrel [ENG] The inner barrel assembly of a wire-line core barrel, designed for removing core from a borehole without pulling the rods. { ri'trēv·ə·bəl 'in·ər 'bar·əl }

retroaction *See* positive feedback. { ˌre·trō'ak·shən }

retrofit [ENG] A modification of equipment to incorporate changes made in later production of similar equipment; it may be done in the factory or field. Derived from retroactive refit. { 're·trōˌfit }

retting [CHEM ENG] Soaking vegetable stalks to decompose the gummy material and release the fibers. { 'red·iŋ }

return [BUILD] The continuation of a molding, projection, member, cornice, or the like, in a different direction, usually at a right angle. *See* echo. { ri'tərn }

return bead *See* quirk bead. { ri'tərn ˌbēd }

return bend [DES ENG] A pipe fitting, equal to two ells, used to connect parallel pipes so that fluid flowing into one will return in the opposite direction through the other. { ri'tərn ˌbend }

return connecting rod [MECH ENG] A connecting rod whose crankpin end is located on the same side of the crosshead as the cylinder. { ri'tərn kə'nek·tiŋ ˌräd }

return difference [CONT SYS] The difference between 1 and the loop transmittance. { ri'tərn ˌdif·rəns }

return-flow burner [MECH ENG] A mechanical oil atomizer in a boiler furnace which regulates the amount of oil to be burned by the portion of oil recirculated to the point of storage. { ri'tərn ˌflō ˌbər·nər }

return idler [MECH ENG] The idler or roller beneath the cover plates on which the conveyor belt rides after the load which it was carrying has been dumped. { ri'tərn ˌīd·lər }

return wall [BUILD] An interior wall of about the same height as the outside wall of a building; distinct from a partition or a low wall. { ri'tərn ˌwȯl }

return wire [ELEC] The ground wire, common wire, or negative wire of a direct-current power circuit. { ri'tərn ˌwīr }

reveal [BUILD] **1.** The side of an opening for a door or window, doorway, or the like, between the doorframe or window frame and the outer surface of the wall. **2.** The distance from the face of a door to the face of the frame on the pivot side. { ri'vēl }

reverberatory furnace [ENG] A furnace in which heat is supplied by burning of fuel in a space between the charge and the low roof. { ri'vər·brəˌtȯr·ēˌfər·nəs }

reverse bias [ELECTR] A bias voltage applied to a diode or a semiconductor junction with polarity such that little or no current flows; the opposite of forward bias. { ri'vərs 'bī·əs }

reverse Brayton cycle [THERMO] A refrigeration cycle using air as the refrigerant but with all system pressures above the ambient. Also known as dense-air refrigeration cycle. { ri'vərs 'brāt·ən ˌsī·kəl }

reverse Carnot cycle [THERMO] An ideal thermodynamic cycle consisting of the processes of the Carnot cycle reversed and in reverse order, namely, isentropic expansion, isothermal expansion, isentropic compression, and isothermal compression. { ri'vərs kär'nō ˌsī·kəl }

reverse current [ELECTR] Small value of direct current that flows when a semiconductor diode has reverse bias. { ri'vərs 'kə·rənt }

reversed air-blast process [CHEM ENG] A gas-making process in which, after a short period of the ordinary blow, the air blast is reversed so as to enter the top of the superheater, and passes back to the top of the generator and down. { ri'vərst 'er ˌblast ˌprä·səs }

reverse engineering [ENG] The analysis of a completed system in order to isolate and identify its individual components or building blocks. { ri'vərs ˌen·jə'nir·iŋ }

reverse feedback *See* negative feedback. { ri'vərs 'fēdˌbak }

reverse flange [ENG] A flange made by shrinking. { ri'vərs 'flanj }

reverse lay [DES ENG] The lay of a wire rope with strands alternating in a right and left lay. { ri'vərs 'lā }

reverse osmosis [CHEM ENG] A technique used in desalination and waste-water treatment; pressure is applied to the surface of a saline (or waste) solution, forcing pure water to pass from the solution through a membrane (hollow fibers of cellulose acetate or nylon) that will not pass sodium or chloride ions. { ri'vərs äs'mō·səs }

reverse pitch [MECH ENG] A pitch on a propeller blade producing thrust in the direction opposite to the normal one. { ri'vərs 'pich }

reverse-printout typewriter [ENG] An automatic typewriter that eliminates conventional carriage return by typing one line from left to right and the next line from right to left. { ri'vərs ¦print,aůt 'tīp,rīd·ər }

reverse-roll coating [ENG] Substrate coating that is premetered between rolls and then wiped off on the web; amount of coating is controlled by the metering gap and the rotational speed of the roll. { ri'vərs ¦rōl 'kōd·iŋ }

reverse voltage [ELEC] In the case of two opposing voltages, voltage of that polarity which produces the smaller current. { ri'vərs 'vōl·tij }

reversible capacitance [ELECTR] Limit, as the amplitude of an applied sinusoidal capacitor voltage approaches zero, of the ratio of the amplitude of the resulting in-phase fundamental-frequency component of transferred charge to the amplitude of the applied voltage, for a given constant bias voltage superimposed on the sinusoidal voltage. { ri'vər·sə·bəl kə'pas·əd·əns }

reversible engine [THERMO] An ideal engine which carries out a cycle of reversible processes. { ri'vər·sə·bəl 'en·jən }

reversible path [THERMO] A path followed by a thermodynamic system such that its direction of motion can be reversed at any point by an infinitesimal change in external conditions; thus the system can be considered to be at equilibrium at all points along the path. { ri'vər·sə·bəl 'path }

reversible-pitch propeller [MECH ENG] A type of controllable-pitch propeller; of either controllable or constant speed, it has provisions for reducing the pitch to and beyond the zero value, to the negative pitch range. { ri'vər·sə·bəl ¦pich prə'pel·ər }

reversible process [THERMO] An ideal thermodynamic process which can be exactly reversed by making an indefinitely small change in the external conditions. Also known as quasistatic process. { ri'vər·sə·bəl 'prä·səs }

reversible steering gear [MECH ENG] A steering gear for a vehicle which permits road shock and wheel deflections to come through the system and be felt in the steering control. { ri'vər·sə·bəl 'stir·iŋ ˌgir }

reversible tramway *See* jig back. { ri'vər·sə·bəl 'tram,wā }

reversible transit circle [ENG] A transit circle that can be lifted out of its bearings and rotated through 180°, enabling systematic errors in both orientations to be determined. { ri'vər·sə·bəl 'tran·zət ˌsər·kəl }

reversing thermometer [ENG] A mercury-in-glass thermometer which records temperature upon being inverted and thereafter retains its reading until returned to the first position. { ri'vərs·iŋ thər'mäm·əd·ər }

reversing water bottle *See* Nansen bottle. { ri'vərs·iŋ 'wȯd·ər ˌbäd·əl }

reversion [CHEM ENG] In rubber manufacture, a decrease in rubber modulus or viscosity caused by overworking. { ri'vər·zhən }

revetment [CIV ENG] A facing made on a soil or rock embankment to prevent scour by weather or water. { rə'vet·mənt }

revolute-coordinate robot *See* jointed-arm robot. { 'rev·ə,lüt kō¦ȯrd·ən·ət 'rō,bät }

revolute joint [MECH ENG] A robotic articulation consisting of a pin with one degree of freedom. { 'rev·ə,lüt ˌjȯint }

revolution [MECH] The motion of a body around a closed orbit. { ˌrev·ə'lü·shən }

revolution counter [ENG] An instrument for registering the number of revolutions of a rotating machine. Also known as revolution indicator. { ˌrev·ə'lü·shən ˌkaůnt·ər }

revolution indicator *See* revolution counter. { ˌrev·ə'lü·shən ˌin·də,kād·ər }

revolution per minute [MECH] A unit of angular velocity equal to the uniform angular velocity of a body which rotates through an angle of 360° (2π radians), so that every point in the body returns to its original position, in 1 minute. Abbreviated rpm. { ˌrev·ə'lü·shən pər 'min·ət }

revolution per second [MECH] A unit of angular velocity equal to the uniform angular velocity of a body which rotates through an angle of 360° (2π radians), so that every point in the body returns to its original position, in 1 second. Abbreviated rps. { ˌrev·ə'lü·shən pər 'sek·ənd }

revolving-block engine [MECH ENG] Any of various engines which combine reciprocating piston motion with rotational motion of the entire engine block. { ri'välv·iŋ ¦bläk 'en·jən }

revolving door [BUILD] A door consisting of four leaves that revolve together on a central vertical axis within a circular vestibule. { ri'välv·iŋ 'dȯr }

revolving shovel [MECH ENG] A digging machine, mounted on crawlers or on rubber tires, that has the machinery deck and attachment on a vertical pivot so that it can swing freely. { ri 'välv·iŋ 'shəv·əl }

Reynier's isolator [ENG] A mechanical barrier made of steel that surrounds the area in which germ-free vertebrates and accessory equipment are housed; has electricity for light and power, an exit-entry opening with a steam barrier, a means for sterile air exchange, glass viewing port, and neoprene gloves which allow handling of the animals. { rān'yās 'ɪs·ə,lād·ər }

Reynolds analogy [CHEM ENG] Relationship

showing the similarity between the transfer of mass, heat, and momentum. { 'ren·əlz ə,nal·ə·jē }

rf preheating *See* radio-frequency preheating. { ¦är¦ef prē'hēd·iŋ }

rheogoniometry [MECH] Rheological tests to determine the various stress and shear actions on Newtonian and non-Newtonian fluids. { ¦rē·ə·gō·nē'äm·ə·trē }

rheology [MECH] The study of the deformation and flow of matter, especially non-Newtonian flow of liquids and plastic flow of solids. { rē'äl·ə·jē }

rheometer [ENG] An instrument for determining flow properties of solids by measuring relationships between stress, strain, and time. { rē'äm·əd·ər }

rheostat [ELEC] A resistor constructed so that its resistance value may be changed without interrupting the circuit to which it is connected. Also known as variable resistor. { 'rē·ə,stat }

rheostatic braking [ENG] A system of dynamic braking in which direct-current drive motors are used as generators and convert the kinetic energy of the motor rotor and connected load to electrical energy, which in turn is dissipated as heat in a braking rheostat connected to the armature. { ¦rē·ə¦stad·ik 'brāk·iŋ }

rheostriction *See* pinch effect. { 'rē·ə,strik·shən }

rheotaxial growth [ENG] A chemical vapor deposition technique for producing silicon diodes and transistors on a fluid layer having high surface mobility. { ¦rē·ə¦tak·sē·əl 'grōth }

RIAA curve [ENG ACOUS] **1.** Recording Industry Association of America curve representing standard recording characteristics for long-play records. **2.** The corresponding equalization curve for playback of long-play records. { ¦är¦ī¦ā 'kərv }

rib arch [CIV ENG] An arch consisting of ribs placed side by side and extending from the springings on one end to those on the other end. { 'rib ,ärch }

ribbed-clamp coupling [DES ENG] A rigid coupling which is split longitudinally and bored to shaft diameter, with a shim separating the two halves. { 'ribd ¦klamp 'kəp·liŋ }

ribbon [BUILD] A horizontal piece of wood nailed to the face of studs; usually used to support the floor joists. { 'rib·ən }

ribbon conveyor [MECH ENG] A type of screw conveyor which has an open space between the shaft and a ribbon-shaped flight, used for wet or sticky materials which would otherwise build up on the spindle. { 'rib·ən kən'vā·ər }

ribbon microphone [ENG ACOUS] A microphone whose electric output results from the motion of a thin metal ribbon mounted between the poles of a permanent magnet and driven directly by sound waves; it is velocity-actuated if open to sound waves on both sides, and pressure-actuated if open to sound waves on only one side. { 'rib·ən 'mī·krə,fōn }

ribbon mixer [MECH ENG] Device for the mixing of particles, slurries, or pastes of solids by the revolution of an elongated helicoid (spiral) ribbon of metal. { 'rib·ən 'mik·sər }

riblet [DES ENG] Any of the small, longitudinal striations, with spacing on the order of 0.002 inch or 50 micrometers, that are made on the surfaces of ships or aircraft to reduce the drag of turbulent flow. { 'rib·lət }

Richardson automatic scale [ENG] An automatic weighing and recording machine for flowable materials carried on a conveyor; weighs batches from 200 to 1000 pounds (90 to 450 kilograms). { 'rich·ərd·sən ¦ȯd·ə¦mad·ik 'skāl }

riddle [DES ENG] A sieve used for sizing or for removing foreign material from foundry sand or other granular materials. { 'rid·əl }

ridge board [BUILD] A horizontal board placed on edge at the apex of the roof. { 'rij ,bȯrd }

ridge cap [BUILD] Wood or metal cap which is placed over the angle of the ridge. { 'rij ,kap }

ridge pole [BUILD] The horizontal supporting member placed along the ridge of a roof. { 'rij ,pōl }

riffler [DES ENG] A small, curved rasp or file for filing interior surfaces or enlarging holes. { 'rif·lər }

rifle [DES ENG] A drill core that has spiral grooves on its outside surface. [ENG] A borehole that is following a spiral course. { 'rī·fəl }

rifling [MECH ENG] The technique of cutting helical grooves inside a rifle barrel to impart a spinning motion to a projectile around its long axis. { 'rīf·liŋ }

rift saw [DES ENG] **1.** A saw for cutting wood radially from the log. **2.** A circular saw divided into toothed arms for sawing flooring strips from cants. { 'rift ,sȯ }

rig [MECH ENG] A tripod, derrick, or drill machine complete with auxiliary and accessory equipment needed to drill. { rig }

right-and-left-hand chart [IND ENG] A graphic symbolic representation of the motions made by one hand in relation to those made by the other hand. { ¦rīt ən ¦left ¦hand 'chärt }

right-cut tool [DES ENG] A single-point lathe tool which has the cutting edge on the right side when viewed face up from the point end. { 'rīt ¦kət ,tül }

right-hand cutting tool [DES ENG] A cutter whose flutes twist in a clockwise direction. { 'rīt ¦hand 'kəd·iŋ ,tül }

right-handed [DES ENG] **1.** Pertaining to screw threads that allow coupling only by turning in a clockwise direction. **2.** *See* right-laid. { 'rīt ¦han·dəd }

right-hand screw [DES ENG] A screw that advances when turned clockwise. { 'rīt ¦hand 'skrü }

right-laid [DES ENG] Rope or cable construction in which strands are twisted counterclockwise. Also known as right-handed. { 'rīt ¦lād }

right lang lay [DES ENG] Rope or cable in which the individual wires or fibers and the strands are twisted to the right. { 'rīt ¦laŋ ¦lā }

right-of-way [CIV ENG] **1.** Areas of land used for a road and along the side of the roadway. **2.** A

thoroughfare or path established for public use. **3.** Land occupied and used by a railroad or a public utility. { ˈrīt əv ˈwā }

rigid body [MECH] An idealized extended solid whose size and shape are definitely fixed and remain unaltered when forces are applied. { ˈrij·id ˈbäd·ē }

rigid-body dynamics [MECH] The study of the motions of a rigid body under the influence of forces and torques. { ˈrij·id ˈbäd·ē dīˈnam·iks }

rigid coupling [MECH ENG] A mechanical fastening of shafts connected with the axes directly in line. { ˈrij·id ˈkəp·liŋ }

rigid frame [BUILD] A steel skeleton frame in which the end connections of all members are rigid so that the angles they make with each other do not change. { ˈrij·id ˈfrām }

rigidity [MECH] The quality or state of resisting change in form. { riˈjid·əd·ē }

rigidity modulus *See* modulus of elasticity in shear. { riˈjid·əd·ē ˌmäj·ə·ləs }

rigidizer [ENG] A supporting structure providing ridigity to an instrument that might otherwise be subject to undesirable vibrations. { ˌri·jəˈdīz·ər }

rigid pavement [CIV ENG] A thick portland cement pavement on a gravel base and subbase, with steel reinforcement and often with transverse joints. { ˈrij·əd ˈpāv·mənt }

rim [DES ENG] **1.** The outer part of a wheel, usually connected to the hub by spokes. **2.** An outer edge or border, sometimes raised or projecting. { rim }

rim-bearing swing bridge [CIV ENG] A swing bridge that is supported by a cylindrical girder on rollers. { ˈrim ˌber·iŋ ˈswiŋ ˌbrij }

rim clutch [MECH ENG] A frictional contact clutch having surface elements that apply pressure to the rim either externally or internally. { ˈrim ˌkləch }

rim drive [ENG ACOUS] A phonograph or sound recorder drive in which a rubber-covered drive wheel is in contact with the inside of the rim of the turntable. { ˈrim ˌdrīv }

ring [DES ENG] A tie member or chain link; tension or compression applied through the center of the ring produces bending moment, shear, and normal force on radial sections. { riŋ }

ring-and-ball test [CHEM ENG] A test for determining the melting point of asphalt, waxes, and paraffins in which a small ring is fitted with a test sample upon which a small ball is then placed; the melting point is that temperature at which the sample softens sufficiently to allow the ball to fall through the ring. Also known as ball and ring method. { ˈriŋ ən ˈbȯl ˌtest }

ring-and-circle shear [DES ENG] A rotary shear designed for cutting circles and rings where the edge of the metal sheet cannot be used as a start. { ˈriŋ ən ˈsər·kəl ˌshir }

ringbolt [DES ENG] An eyebolt with a ring passing through the eye. { ˈriŋˌbōlt }

ring crusher [MECH ENG] Solids-reduction device with a rotor having loose crushing rings held outwardly by centrifugal force, which crush the feed by impact with the surrounding shell. { ˈriŋ ˌkrəsh·ər }

Ringelmann chart [ENG] A chart used in making subjective estimates of the amount of solid matter emitted by smoke stacks; the observer compares the grayness of the smoke with a series of shade diagrams formed by horizontal and vertical black lines on a white background. { ˈriŋ·gəlˌmän ˌchärt }

ring gage [DES ENG] A cylindrical ring of steel whose inside diameter is finished to gage tolerance and is used for checking the external diameter of a cylindrical object. { ˈriŋ ˌgāj }

ring gate [CIV ENG] A type of gate used to regulate and control the discharge of a morning-glory spillway; like a drum gate, it offers a minimum of interference to the passage of ice or drift over the gate and requires no external power for operation. [ENG] An annular opening through which plastics enter the cavity of an injection or transfer mold. { ˈriŋ ˌgāt }

ring gear [MECH ENG] The ring-shaped gear in an automobile differential that is driven by the propeller shaft pinion and transmits power through the differential to the line axle. { ˈriŋ ˌgir }

ringing [CONT SYS] An oscillatory transient occurring in the output of a system as a result of a sudden change in input. { ˈriŋ·iŋ }

ringing circuit [ELECTR] A circuit which has a capacitance in parallel with a resistance and inductance, with the whole in parallel with a second resistance; it is highly underdamped and is supplied with a step or pulse input. { ˈriŋ·iŋ ˌsər·kət }

ringing time [ENG] In an ultrasonic testing unit, the length of time that the vibrations in a piezoelectric crystal remain after the generation of ultrasonic waves ceases. { ˈriŋ·iŋ ˌtīm }

ring jewel [DES ENG] A type of jewel used as a pivot bearing in a time-keeping device, gyro, or instrument. { ˈriŋ ˌjül }

ring job [MECH ENG] Installation of new piston rings on a piston. { ˈriŋ ˌjäb }

ring laser *See* laser gyro. { ˈriŋ ˌlā·zər }

ring lifter *See* split-ring core lifter. { ˈriŋ ˌlif·tər }

ringlock nail [DES ENG] A nail ringed with grooves to provide greater holding power. { ˈriŋ ˌläk ˌnāl }

ring-oil [MECH ENG] To oil (a bearing) by conveying the oil to the point to be lubricated by means of a ring, which rests upon and turns with the journal, and dips into a reservoir containing the lubricant. { ˈriŋ ˌȯil }

ring road *See* beltway. { ˈriŋ ˌrōd }

ring-roller mill [MECH ENG] A grinding mill in which material is fed past spring-loaded rollers that apply force against the sides of a revolving bowl. Also known as roller mill. { ˈriŋ ˈrōl·ər ˌmil }

riometer [ENG] An instrument that measures changes in ionospheric absorption of electromagnetic waves by determining and recording the level of extraterrestrial cosmic radio noise.

Derived from relative ionospheric opacity meter. { rī'äm·əd·ər }

rip [ENG] To saw wood with the grain. { rip }

ripbit *See* detachable bit; jackbit. { 'rip,bit }

ripping bar [DES ENG] A steel bar with a chisel at one end and a curved claw for pulling nails at the other. Also known as claw bar; wrecking bar. { 'rip·iŋ ˌbär }

ripping punch [DES ENG] A tool with a rectangular cutting edge, used in a punch press to crosscut metal plates. { 'rip·iŋ ˌpənch }

ripple [ELEC] The alternating-current component in the output of a direct-current power supply, arising within the power supply from incomplete filtering or from commutator action in a dc generator. { 'rip·əl }

riprap [CIV ENG] A foundation or revetment in water or on soft ground made of irregularly placed stones or pieces of boulders; used chiefly for river and harbor work, for roadway filling, and on embankments. { 'rip,rap }

ripsaw [MECH ENG] A heavy-tooth power saw used for cutting wood with the grain. { 'rip,sȯ }

rise and run [CIV ENG] The pitch of an inclined surface or member, usually expressed as the ratio of the vertical rise to the horizontal span. { ¦rīz ən 'rən }

riser [CHEM ENG] That portion of a bubble-cap assembly in a distillation tower that channels the rising vapor and causes it to flow downward to pass through the liquid held on the bubble plate. [CIV ENG] **1.** A board placed vertically beneath the tread of a step in a staircase. **2.** A vertical steam, water, or gas pipe. { 'rīz·ər }

riser plate [CIV ENG] A plate used to support a tapering switch rail above the base of the rail; used with a railroad gage or tie plate to maintain minimum gage. { 'rīz·ər ˌplāt }

rise time [CONT SYS] The time it takes for the output of a system to change from a specified small percentage (usually 5 or 10) of its steady-state increment to a specified large percentage (usually 90 or 95). [ELEC] The time for the pointer of an electrical instrument to make 90% of the change to its final value when electric power suddenly is applied from a source whose impedance is high enough that it does not affect damping. { 'rīz ˌtīm }

rising hinge [BUILD] A hinge that raises a door slightly as it is opened. { 'rīz·iŋ 'hinj }

risk [ENG] The potential realization of undesirable consequences from hazards arising from a possible event. { risk }

risk analysis [ENG] The scientific study of risk. { 'risk əˌnal·ə·səs }

risk management [ENG] The overall systematic approach to analyzing risk and implementing risk controls. { 'risk ˌman·ij·mənt }

Ritchie's experiment [THERMO] An experiment that uses a Leslie cube and a differential air thermometer to demonstrate that the emissivity of a surface is proportional to its absorptivity. { 'rich·ēz ik,sper·ə·mənt }

Rittinger's law [MECH ENG] The law that energy needed to reduce the size of a solid particle is directly proportional to the resultant increase in surface area. { 'rit·ən·jərz ˌlȯ }

river engineering [CIV ENG] A branch of transportation engineering consisting of the physical measures which are taken to improve a river and its banks. { 'riv·ər ˌen·jəˌnir·iŋ }

river gage [ENG] A device for measuring the river stage; types in common use include the staff gage, the water-stage recorder, and wire-weight gage. Also known as stream gage. { 'riv·ər ˌgāj }

rivet [DES ENG] A short rod with a head formed on one end; it is inserted through aligned holes in parts to be joined, and the protruding end is pressed or hammered to form a second head. { 'riv·ət }

riveting [ENG] The permanent joining of two or more machine parts or structural members, usually plates, by means of rivets. { 'riv·əd·iŋ }

riveting hammer [MECH ENG] A hammer used for driving rivets. { 'riv·əd·iŋ ˌham·ər }

rivet pitch [ENG] The center-to-center distance of adjacent rivets. { 'riv·ət ˌpich }

road [CIV ENG] An open way for travel and transportation. { rōd }

roadbed [CIV ENG] The earth foundation of a highway or a railroad. { 'rōdˌbed }

road capacity [CIV ENG] The maximum traffic flow obtainable on a given roadway, using all available lanes, usually expressed in vehicles per hour or vehicles per day. { 'rōd kəˌpas·əd·ē }

road grade [CIV ENG] The level and gradient of a road, measured along its center way. { 'rōd ˌgrād }

road net [CIV ENG] The system of roads available within a particular locality or area. { 'rōd ˌnet }

road octane number [ENG] A numerical value for automotive antiknock properties of a gasoline; determined by operating a car over a stretch of level road or on a chassis dynamometer under conditions simulating those encountered on the highway. { ¦rōd 'äkˌtān ˌnəm·bər }

road test [ENG] A motor-vehicle test conducted on the highway or on a chassis dynamometer to determine the performance of fuels or lubricants or the performance of the vehicle. { 'rōd ˌtest }

roadway [CIV ENG] The portion of the thoroughfare over which vehicular traffic passes. { 'rōdˌwā }

roaster [ENG] Equipment for the heating of materials, such as in pyrite roasting; a furnace. { 'rōs·tər }

roasting regeneration [CHEM ENG] Regeneration of a processing (treating) clay by heating or burning it in contact with air to remove combustible impurities adsorbed onto the surface. { 'rōst·iŋ rēˌjen·ə'rā·shən }

Roberts evaporator *See* short-tube vertical evaporator. { 'räb·ərts i'vap·əˌrād·ər }

Roberts' linkage [MECH ENG] A type of approximate straight-line mechanism which provided, early in the 19th century, a practical means of making straight metal guides for the slides in a metal planner. { 'räb·ərts ˌliŋ·kij }

Robins-Messiter system [MECH ENG] A stacking conveyor system in which material arrives on a conveyor belt and is fed to one or two wing conveyors. { 'räb·ənz 'mes·ə·tər ˌsis·təm }

Robitzsch actinograph [ENG] A pyranometer whose design utilizes three bimetallic strips which are exposed horizontally at the center of a hemispherical glass bowl; the outer strips are white reflectors, and the center strip is a blackened absorber; the bimetals are joined in such a manner that the pen of the instrument deflects in proportion to the difference in temperature between the black and white strips, and is thus proportional to the intensity of the received radiation; this instrument must be calibrated periodically. { 'rō,bitsh ak'tin·əˌgraf }

robot [CONT SYS] A mechanical device that can be programmed to perform a variety of tasks of manipulation and locomotion under automatic control. { 'rōˌbät }

robotics [IND ENG] The study of problems associated with the design, application, and control and sensory systems of self-controlled devices. { rō'bäd·iks }

roc [ELEC] A unit of electrical conductivity equal to the conductivity of a material in which an electric field of 1 volt per centimeter gives rise to a current density of 1 ampere per square centimeter. Derived from reciprocal ohm centimeter. { räk }

Roche lobes [MECH] **1.** Regions of space surrounding two massive bodies revolving around each other under their mutual gravitational attraction, such that the gravitational attraction of each body dominates the lobe surrounding it. **2.** In particular, the effective potential energy (referred to a system of coordinates rotating with the bodies) is equal to a constant V_0 over the surface of the lobes, and if a particle is inside one of the lobes and if the sum of its effective potential energy and its kinetic energy is less than V_0, it will remain inside the lobe. { 'rōch ˌlōbz }

rock bit [ENG] Any one of many different types of roller bits used on rotary-type drills for drilling large-size holes in soft to medium-hard rocks. { 'räk ˌbit }

rockbolt [ENG] A bar, usually constructed of steel, which is inserted into predrilled holes in rock and secured for the purpose of ground control. { 'räkˌbōlt }

rock bolting [ENG] A method of securing or strengthening closely jointed or highly fissured rocks in mine workings, tunnels, or rock abutments by inserting and firmly anchoring rock bolts oriented perpendicular to the rock face or mine opening. { 'räk ˌbōlt·iŋ }

rock channeler [MECH ENG] A machine used in quarrying for cutting an artificial seam in a mass of stone. { 'räk ˌchan·əl·ər }

rock drill [MECH ENG] A machine for boring relatively short holes in rock for blasting purposes; motive power may be compressed air, steam, or electricity. { 'räk ˌdril }

rocker [CIV ENG] A support at the end of a truss or girder which permits rotation and horizontal movement to allow for expansion and contraction. { 'räk·ər }

rocker arm [MECH ENG] In an internal combustion engine, a lever that is pivoted near its center and operated by a pushrod at one end to raise and depress the valve stem at the other end. { 'räk·ər ˌärm }

rocker bearing [CIV ENG] A bridge support that is free to rotate but cannot move horizontally. { 'räk·ər ˌber·iŋ }

rocker bent [CIV ENG] A bent used on a bridge span; hinged at one or both ends to provide for the span's expansion and contraction. { 'räk·ər ˌbent }

rocker cam [MECH ENG] A cam that moves with a rocking motion. { 'räk·ər ˌkam }

rocker panel [ENG] The part of the paneling on a passenger vehicle located below the passenger compartment doorsill. { 'räk·ər ˌpan·əl }

rocketsonde *See* meteorological rocket. { 'räk·ətˌsänd }

rocket station [ENG] A life-saving station equipped with line-carrying rocket apparatus. { 'räk·ət ˌstā·shən }

rock-fill [CIV ENG] Composed of large, loosely placed rocks. { 'räk ˌfil }

rock-fill dam [CIV ENG] A dam constructed of loosely placed rock or stone. { 'räk ˌfil ˌdam }

rocking furnace [MECH ENG] A horizonal, cylindrical melting furnace that is rolled back and forth on a geared cradle. { 'räk·iŋ ˌfər·nəs }

rocking pier [CIV ENG] A pier that is hinged to allow for longitudinal expansion or contraction of the bridge. { 'räk·iŋ ˌpir }

rocking valve [MECH ENG] An engine valve in which a disk or cylinder turns in its seat to permit fluid flow. { 'räk·iŋ ˌvalv }

rock pedestal *See* pedestal. { 'räk ˌped·ə·stəl }

Rockwell hardness [ENG] A measure of hardness of a material as determined by the Rockwell hardness test. { 'räkˌwel 'härd·nəs }

Rockwell hardness test [ENG] One of the arbitrarily defined measures of resistance of a material to indentation under static or dynamic load; depth of indentation of either a steel ball or a 120° conical diamond with rounded point, 1/16, 1/8, 1/4, or 1/2 inch (1.5875, 3.175, 6.35, 12.7 millimeters) in diameter, called a brale, under prescribed load is the basis for Rockwell hardness; 60, 100, 150 kilogram load is applied with a special machine, and depth of impression under initial minor load is indicated on a dial whose graduations represent hardness number. { 'räk ˌwel 'härd·nəs ˌtest }

rod [DES ENG] **1.** A bar whose end is slotted, tapered, or screwed for the attachment of a drill bit. **2.** A thin, round bar of metal or wood. *See* perch. { räd }

rod bit [DES ENG] A bit designed to fit a reaming shell that is threaded to couple directly to a drill rod. { 'räd ˌbit }

rod coupling [DES ENG] A double-pin-thread coupling used to connect two drill rods together. { 'räd ˌkəp·liŋ }

rodding [ENG] An operation in which a rod is passed through a length of tubing such as a rifle or pipework to determine if the bore is clear. { 'räd·iŋ }

rod level [ENG] A spirit level attached to a level rod or stadia rod to ensure the vertical position of the rod prior to instrument reading. { 'räd ˌlev·əl }

rod mill [MECH ENG] A pulverizer operated by the impact of heavy metal rods. { 'räd ˌmil }

rod string [MECH ENG] Drill rods coupled to form the connecting link between the core barrel and bit in the borehole and the drill machine at the collar of the borehole. { 'räd ˌstriŋ }

rod stuffing box [ENG] An annular packing gland fitting between the drill rod and the casing at the borehole collar; allows the rod to rotate freely but prevents the escape of gas or liquid under pressure. { 'räd 'stəf·iŋ ˌbäks }

roentgen current [ELEC] An electric current arising from the motion of polarization charges, as in the rotation of a dielectric in a charged capacitor. { 'rent·gən ˌkər·ənt }

Rogowski coil [ENG] A device for measuring alternating current without making contact with the current-carrying conductor, which consists of an air-core coil placed around the conductor in a toroidal fashion so that the alternating magnetic field produced by the current induces a voltage in the coil. { rə'gäv·skē ˌkȯil }

rolamite mechanism [MECH ENG] An elemental mechanism consisting of two rollers contained by two parallel planes and bounded by a fixed S-shaped band under tension. { rō·lə,mīt ˌmek·əˌniz·əm }

roll [MECH] Rotational or oscillatory movement of an aircraft or similar body about a longitudinal axis through the body; it is called roll for any degree of such rotation. [MECH ENG] A cylinder mounted in bearings; used for such functions as shaping, crushing, moving, or printing work passing by it. { rōl }

roll acceleration [MECH] The angular acceleration of an aircraft or missile about its longitudinal or X axis. { 'rōl ikˌsel·əˌrā·shən }

roll axis [MECH] A longitudinal axis through an aircraft, rocket, or similar body, about which the body rolls. { 'rōl ˌak·səs }

roll bar [DES ENG] A metal bar installed overhead on a roofless automotive vehicle in order to protect the occupants if the car rolls over. { 'rōl ˌbär }

roll cage [DES ENG] A frame of metal bars that is installed in a racing car around the driver's seat to protect the driver in the event of an accident. { 'rōl ˌkāj }

roll control [ENG] The exercise of control over a missile so as to make it roll to a programmed degree, usually just before pitchover. { 'rōl kənˌtrōl }

roll crusher [MECH ENG] A crusher having one or two toothed rollers to reduce the material. { 'rōl ˌkrəsh·ər }

rolled joint [ENG] A joint made by expanding a tube in a tube sheet hole by use of an expander. { 'rōld 'jȯint }

roller [DES ENG] A cylindrical device for transmitting motion and force by rotation. { 'rō·lər }

roller analyzer [ENG] Device for quantitative separation of fine particles (down to 5 micrometers) by use of the graduated lift of a variable-rate pneumatic stream. { 'rō·lər ˌan·əˌlīz·ər }

roller bearing [MECH ENG] A shaft bearing characterized by parallel or tapered steel rollers confined between outer and inner rings. { 'rō·lər ˌber·iŋ }

roller bit *See* cone rock bit. { 'rō·lər ˌbit }

roller cam follower [MECH ENG] A follower consisting of a rotatable wheel at the end of the shaft. { 'rō·lər 'kam ˌfäl·ə·wər }

roller chain [MECH ENG] A chain drive assembled from roller links and pin links. { 'rō·lər ˌchān }

roller coating [ENG] The application of paints, lacquers, or other coatings onto raised designs or letters by means of a roller. { 'rō·lər ˌkōd·iŋ }

roller cone bit [ENG] A drilling bit containing two to four cutters (cones) mounted on very rugged bearings. Also known as bit cone; rock bit. { 'rōl·ər ˌkōn ˌbit }

roller conveyor [MECH ENG] A gravity conveyor having a track of parallel tubular rollers set at a definite grade, usually on antifriction bearings, at fixed locations, over which package goods which are sufficiently rigid to prevent sagging between rollers are moved by gravity or propulsion. { 'rō·lər kənˌvā·ər }

roller drying [CHEM ENG] A method used to dry milk for purposes other than human consumption; concentrated milk is fed between two heated and narrowly spaced stainless steel rollers, the adhering thin film of milk dries as the rollers turn and is scraped off the roller by a doctor blade. { 'rō·lər ˌdrī·iŋ }

roller gate [CIV ENG] A cylindrical, usually hollow crest gate that is raised and lowered by large toothed wheels running on sloping racks. { 'rō·lər ˌgāt }

roller-hearth kiln [ENG] A type of tunnel kiln through which the ware is conveyed on ceramic rollers. { 'rō·lər ˌhärth ˌkil }

roller leveling [MECH ENG] Leveling flat stock by passing it through a machine having a series of rolls whose axes are staggered about a mean parallel path by a decreasing amount. { 'rō·lər 'lev·ə·liŋ }

roller mill *See* ring-roller mill. { 'rō·lər ˌmil }

roller pulverizer [MECH ENG] A pulverizer operated by the crushing action of rotating rollers. { 'rō·lər 'pəl·vəˌrīz·ər }

roller stamping die [MECH ENG] An engraved roller used for stamping designs and other markings on sheet metal. { 'rō·lər 'stamp·iŋ ˌdī }

rolling [MECH] Motion of a body across a surface combined with rotational motion of the body so that the point on the body in contact with the surface is instantaneously at rest. { 'rōl·iŋ }

rolling contact [MECH] Contact between bodies

such that the relative velocity of the two contacting surfaces at the point of contact is zero. { 'rōl·iŋ 'kän,takt }

rolling-contact bearing [MECH ENG] A bearing composed of rolling elements interposed between an outer and inner ring. { 'rōl·iŋ ¦kän,takt 'ber·iŋ }

rolling door [ENG] A door that moves up and down or from side to side by means of wheels moving along a track. { 'rōl·iŋ 'dȯr }

rolling friction [MECH] A force which opposes the motion of any body which is rolling over the surface of another. { 'rōl·iŋ 'frik·shən }

rolling lift bridge [CIV ENG] A bridge having on the shore end of the lifting portion a segmental bearing that rolls on a flat surface. { 'rōl·iŋ 'lift ˌbrij }

rolling radius [DES ENG] For an automotive vehicle, the distance from the center of an axle to the ground. { 'rōl·iŋ ˌrād·ē·əs }

roll mill [MECH ENG] A series of rolls operating at different speeds for grinding and crushing. { 'rōl ˌmil }

roll-off [ELECTR] Gradually increasing loss or attenuation with increase or decrease of frequency beyond the substantially flat portion of the amplitude-frequency response characteristic of a system or transducer. { 'rōl ˌȯf }

roll set [ENG] A series of paired convex and concave contoured rolls in a roll forming machine that progressively form a workpiece of uniform cross section. { 'rōl ˌset }

roll straightening [ENG] Unbending of metal stock by passing it through staggered rolls in different planes. { 'rōl ˌstrāt·ən·iŋ }

roll threading [MECH ENG] Threading a metal workpiece by rolling it either between grooved circular rolls or between grooved straight lines. { 'rōl ˌthred·iŋ }

rom [ELEC] A unit of electrical conductivity, equal to the conductivity of a material in which an electric field of 1 volt per meter gives rise to a current density of 1 ampere per square meter. Derived from reciprocal ohm meter. { räm }

rood [MECH] A unit of area, equal to 1/4 acre, or 10,890 square feet, or 1011.7141056 square meters. { rüd }

roof [BUILD] The cover of a building or similar structure. { rüf }

roof beam [BUILD] A load-bearing member in the roof structure. { 'rüf ˌbēm }

roof drain [BUILD] A drain for receiving water that has collected on the surface of a roof and discharging it into a downspout. { 'rüf ˌdrān }

roofing nail [DES ENG] A nail used for attaching paper or shingle to roof boards; usually short with a barbed shank and a large flat head. { 'rüf·iŋ ˌnāl }

roof truss [BUILD] A truss used in roof construction; it carries the weight of roof deck and framing and of wind loads on the upper chord; an example is a Fink truss. { 'rüf ˌtrəs }

room [BUILD] A partitioned-off area inside a building or dwelling. { rüm }

root [CIV ENG] The portion of a dam which penetrates into the ground where the dam joins the hillside. [DES ENG] The bottom of a screw thread. { rüt }

root circle [DES ENG] A hypothetical circle defined at the bottom of the tooth spaces of a gear. { 'rüt ˌsər·kəl }

rooter [ENG] A heavy plowing device equipped with teeth and used for breaking up the ground surface; a towed scarifier. { 'rüd·ər }

root fillet [DES ENG] The rounded corner at the angle of a gear tooth flank and the bottom land. { 'rüt ˌfil·ət }

root locus plot [CONT SYS] A plot in the complex plane of values at which the loop transfer function of a feedback control system is a negative number. { 'rüt ¦lō·kəs ˌplät }

root-mean-square current *See* effective current. { 'rüt ˌmēn 'skwer 'kə·rənt }

Roots blower [MECH ENG] A compressor in which a pair of hourglass-shaped members rotate within a casing to deliver large volumes of gas at relatively low pressure increments. { 'rüts ˌblō·ər }

rope-and-button conveyor [MECH ENG] A conveyor consisting of an endless wire rope or cable with disks or buttons attached at intervals. { ¦rōp ən ¦bət·ən kən,vā·ər }

rope boring [ENG] A method similar to rod drilling except that rigid rods are replaced by a steel rope to which the boring tools are attached and allowed to fall by their own weight. { 'rōp ˌbȯr·iŋ }

rope drive [MECH ENG] A system of ropes running in grooved pulleys or sheaves to transmit power over distances too great for belt drives. { 'rōp ˌdrīv }

rope sheave [DES ENG] A grooved wheel, usually made of cast steel or heat-treated alloy steel, used for rope drives. { 'rōp ˌshēv }

rope socket [DES ENG] A drop-forged steel device, with a tapered hole, which can be fastened to the end of a wire cable or rope and to which a load may be attached. { 'rōp ˌsäk·ət }

ropewalk [ENG] A long walkway down which a worker carries and lays rope in a manufacturing plant. { 'rōp,wȯk }

ropeway [ENG] One or a pair of steel cables between several supporting towers which serve as tracks for transporting materials in mountainous areas or at sea. { 'rōp,wā }

rose bit [DES ENG] A hardened steel or alloy noncore bit with a serrated face to cut or mill out bits, casing, or other metal objects lost in the hole. { 'rōz ˌbit }

rose chucking reamer [DES ENG] A machine reamer with a straight or tapered shank and a straight or spiral flute; cutting is done at the ends of the teeth only; produces a rough hole since there are few teeth. { 'rōz 'chək·iŋ ˌrē·mər }

rose reamer [DES ENG] A reamer designed to cut on the beveled leading ends of the teeth rather than on the sides. { 'rōz 'rē·mər }

Rossby diagram [THERMO] A thermodynamic

diagram, named after its designer, with mixing ratio as abscissa and potential temperature as ordinate; lines of constant equivalent potential temperature are added. { 'rōs·bē ˌdī·əˌgram }

Ross feeder [MECH ENG] A chute for conveying bulk materials by means of a screen of heavy endless chains hung on a sprocket shaft; rotation of the shaft causes materials to slide. { 'rōs 'fēd·ər }

Rossman drive [ENG] A method used to provide speed control of alternating-current motors; an induction motor stator is mounted on trunnion bearings and driven with an auxiliary motor, to provide the desired change in slip between the stator and rotor. { 'rōs·mən ˌdrīv }

rotameter [ENG] A variable-area, constant-head, rate-of-flow volume meter in which the fluid flows upward through a tapered tube, lifting a shaped weight to a position where upward fluid force just balances its weight. { rō'tam·əd·ər }

rotary [MECH ENG] **1.** A rotary machine, such as a rotary printing press or a rotary well-drilling machine. **2.** The turntable and its supporting and rotating assembly in a well-drilling machine. { 'rōd·ə·rē }

rotary abutment meter [ENG] A type of positive displacement meter in which two displacement rotating vanes interleave with cavities on an abutment rotor in such a way that the three elements are geared together. { 'rōd·ə·rē ə'bət·mənt ˌmēd·ər }

rotary actuator [MECH ENG] A device that converts electric energy into controlled rotary force; usually consists of an electric motor, gear box, and limit switches. { 'rōd·ə·rē 'ak·chəˌwād·ər }

rotary air heater [MECH ENG] A regenerative air heater in which heat-transferring members are moved alternately through the gas and air streams. { 'rōd·ə·rē 'er ˌhēd·ər }

rotary annular extractor [MECH ENG] Vertical, cylindrical shell with an inner, rotating cylinder; liquids to be contacted flow countercurrently through the annular space between the rotor and shell; used for liquid-liquid extraction processes. { 'rōd·ə·rē 'an·yə·lər ik'strak·tər }

rotary atomizer [MECH ENG] A hydraulic atomizer having the pump and nozzle combined. { 'rōd·ə·rē 'ad·əˌmīz·ər }

rotary belt cleaner [MECH ENG] A series of blades symmetrically spaced about the axis of rotation and caused to scrape or beat against the conveyor belt for the purpose of cleaning. { 'rōd·ə·rē 'belt ˌklē·nər }

rotary blower [MECH ENG] Positive-displacement, rotating-impeller, air-movement device; can be straight-lobe, screw, sliding-vane, or liquid-piston type. { 'rōd·ə·rē 'blō·ər }

rotary boring [MECH ENG] A system of boring in which rock penetration is achieved by the rotation of the hollow cutting tool. { 'rōd·ə·rē 'bȯr·iŋ }

rotary bucket [MECH ENG] A 12- to 96-inch-diameter (30- to 244-centimeter) posthole augerlike device, the bottom end of which is equipped with cutting teeth used to rotary-drill large-diameter shallow holes to obtain samples of soil lying above the groundwater level. { 'rōd·ə·rē 'bak·ət }

rotary-combustion engine *See* Wankel engine. { ˌrōd·ə·rē kəm'bəs·chən ˌen·jən }

rotary compressor [MECH ENG] A positive-displacement machine in which compression of the fluid is effected directly by a rotor and without the usual piston, connecting rod, and crank mechanism of the reciprocating compressor. { 'rōd·ə·rē kəm'pres·ər }

rotary crane [MECH ENG] A crane consisting of a boom pivoted to a fixed or movable structure. { 'rōd·ə·rē 'krān }

rotary crusher [MECH ENG] Solids-reduction device in which a high-speed rotating cone on a vertical shaft forces solids against a surrounding shell. { 'rōd·ə·rē 'krəsh·ər }

rotary-cup oil burner [ENG] Oil burner that uses centrifugal force to spray fuel oil from a rotary fuel atomizing cup into the combustion chamber. { 'rōd·ə·rē ˌkəp 'ȯil ˌbər·nər }

rotary cutter [MECH ENG] Device used to cut tough or fibrous materials by the shear action between two sets of blades, one set on a rotating holder, the other stationary on the surrounding casing. { 'rōd·ə·rē 'kəd·ər }

rotary-disk contactor [CHEM ENG] Liquid-liquid contactor, having a vertical cylindrical shell with vertical rotating shaft upon which are mounted a spaced series of flat disks; spinning of the disks forces liquid into shell-mounted baffles, causing mixing; used for liquid-liquid extraction processes. Also known as RDC extractor. { 'rōd·ə·rē ˌdisk 'känˌtak·tər }

rotary drill [MECH ENG] Any of various drill machines that rotate a rigid, tubular string of rods to which is attached a rock cutting bit, such as an oil well drilling apparatus. { 'rōd·ə·rē 'dril }

rotary drilling [MECH ENG] The act or process of drilling a borehole by means of a rotary-drill machine, such as in drilling an oil well. { 'rōd·ə·rē 'dril·iŋ }

rotary dryer [MECH ENG] A cylindrical furnace slightly inclined to the horizontal and rotated on suitable bearings; moisture is removed by rising hot gases. { 'rōd·ə·rē 'drī·ər }

rotary engine [MECH ENG] A positive displacement engine (such as a steam or internal combustion type) in which the thermodynamic cycle is carried out in a mechanism that is entirely rotary and without the more customary structural elements of a reciprocating piston, connecting rods, and crankshaft. { 'rōd·ə·rē 'en·jən }

rotary excavator *See* bucket-wheel excavator. { 'rōd·ə·rē 'ek·skəˌvād·ər }

rotary feeder [MECH ENG] Device in which a rotating element or vane discharges powder or granules at a predetermined rate. { 'rōd·ə·rē 'fēd·ər }

rotary filter *See* drum filter. { 'rōd·ə·rē 'fil·tər }

rotary furnace [MECH ENG] A heat-treating furnace of circular construction which rotates the workpiece around the axis of the furnace during

heat treatment; workpieces are transported through the furnace along a circular path. { 'rōd·ə·rē 'fər·nəs }

rotary kiln [ENG] A long cylindrical kiln lined with refractory, inclined at a slight angle, and rotated at a slow speed. { 'rōd·ə·rē 'kil }

rotary-percussive drill [MECH ENG] Drilling machine which operates as a rotary machine by the action of repeated blows to the bit. { 'rōd·ə·rē pər'kəs·iv 'dril }

rotary pump [MECH ENG] A displacement pump that delivers a steady flow by the action of two members in rotational contact. { 'rōd·ə·rē 'pəmp }

rotary roughening [MECH ENG] A metal preparation technique in which the workpiece surface is roughened by a cutting tool. { 'rōd·ə·rē 'rəf·ə·niŋ }

rotary shear [MECH ENG] A sheet-metal cutting machine having two rotary-disk cutters mounted on parallel shafts and driven in unison. { 'rōd·ə·rē 'shir }

rotary shot drill [MECH ENG] A rotary drill used to drill blastholes. { 'rōd·ə·rē 'shät ˌdril }

rotary swager [MECH ENG] A machine for reducing diameter or wall thickness of a bar or tube by delivering hammerlike blows to the surface of the work supported on a mandrel. { 'rōd·ə·rē 'swā·jər }

rotary table [MECH ENG] A milling machine attachment consisting of a round table with T-shaped slots and rotated by means of a handwheel actuating a worm and worm gear. { 'rōd·ə·rē 'tā·bəl }

rotary vacuum filter *See* drum filter. { 'rōd·ə·rē 'vak·yəm ˌfil·tər }

rotary valve [MECH ENG] A valve for the admission or release of working fluid to or from an engine cylinder where the valve member is a ported piston that turns on its axis. { 'rōd·ə·rē 'valv }

rotary-vane meter [ENG] A type of positive-displacement rate-of-flow meter having spring-loaded vanes mounted on an eccentric drum in a circular cavity; each time the drum rotates, a fixed volume of fluid passes through the meter. { 'rōd·ə·rē ˌvān 'mēd·ər }

rotary voltmeter [ENG] Type of electrostatic voltmeter used for measuring high voltages. { 'rōd·ə·rē 'vōlt,mēd·ər }

rotating-beam ceilometer [ENG] An electronic, automatic-recording meteorological device which determines cloud height by means of triangulation. { 'rō,tād·iŋ ˌbēm sē'läm·əd·ər }

rotating-coil gaussmeter [ENG] An instrument for measuring low magnetic field strengths and flux densities by measuring the voltage induced in a search coil that is rotated in the field at constant speed. { ˌrō,tād·iŋ ˌkȯil 'gaùs,mēd·ər }

rotating coordinate system [MECH] A coordinate system whose axes as seen in an inertial coordinate system are rotating. { 'rō,tād·iŋ kō'ȯrd·ən·ət ˌsis·təm }

rotating-drum heat transfer [CHEM ENG] Procedure for solidifying layers of solids onto the outside surface of an inside-cooled drum that is partly immersed in a melt of the solids material. { 'rō,tād·iŋ ˌdrəm 'hēt ˌtranz·fər }

rotating meter *See* velocity-type flowmeter. { 'rō ˌtād·iŋ 'mēd·ər }

rotating spreader [ENG] Plastics-molding injection device consisting of a finned torpedo that is rotated by a shaft extending through a tubular cross-section injection ram behind it. { 'rō,tād·iŋ 'spred·ər }

rotating viscometer vacuum gage [ENG] Vacuum (reduced-pressure) measurement device in which the torque on a spinning armature is proportional to the viscosity (and the pressure) of the rarefied gas being measured; sensitive for absolute pressures of 1 millimeter of mercury (133.32 pascals), down to a few tens of micrometers. { 'rō,tād·iŋ vi'skäm·əd·ər 'vak·yəm ˌgāj }

rotation [MECH] Also known as rotational motion. **1.** Motion of a rigid body in which either one point is fixed, or all the points on a straight line are fixed. **2.** Angular displacement of a rigid body. **3.** The motion of a particle about a fixed point. { rō'tā·shən }

rotational casting [ENG] Method to make hollow plastic articles from plastisols and lattices using a hollow mold rotated in one or two planes; the hot mold fuses the plastisol into a gel, which is then chilled and the product stripped out. Also known as rotational molding. { rō'tā·shən·əl 'kast·iŋ }

rotational energy [MECH] The kinetic energy of a rigid body due to rotation. { rō'tā·shən·əl 'en·ər·jē }

rotational impedance [MECH] A complex quantity, equal to the phasor representing the alternating torque acting on a system divided by the phasor representing the resulting angular velocity in the direction of the torque at its point of application. Also known as mechanical rotational impedance. { rō'tā·shən·əl im'pēd·əns }

rotational inertia *See* moment of inertia. { rō'tā·shən·əl i'nər·shə }

rotational molding *See* rotational casting. { rō'tā·shən·əl 'mōld·iŋ }

rotational reactance [MECH] The imaginary part of the rotational impedance. Also known as mechanical rotational reactance. { rō'tā·shən·əl rē'ak·təns }

rotational resistance [MECH] The real part of rotational impedance; it is responsible for dissipation of energy. Also known as mechanical rotational resistance. { rō'tā·shən·əl ri'zis·təns }

rotational stability [MECH] Property of a body for which a small angular displacement sets up a restoring torque that tends to return the body to its original position. { rō'tā·shən·əl stə'bil·əd·ē }

rotational strain [MECH] Strain in which the orientation of the axes of strain is changed. { rō'tā·shən·əl 'strān }

rotational traverse [MECH ENG] The maximum angle through which a body can rotate with one

point of the body remaining fixed at an axis or center. { rō'tā·shən·əl trə'vərs }

rotational viscometer *See* Couette viscometer. { rō'tā·shən·əl vi'skäm·əd·ər }

rotation anemometer [ENG] A type of anemometer in which the rotation of an element serves to measure the wind speed; rotation anemometers are divided into two classes: those in which the axis of rotation is horizontal, as exemplified by the windmill anemometer; and those in which the axis is vertical, such as the cup anemometer. { rō'tā·shən ˌan·ə'mäm·əd·ər }

rotation coefficients [MECH] Factors employed in computing the effects on range and deflection which are caused by the rotation of the earth; they are published only in firing tables involving comparatively long ranges. { rō'tā·shən ˌkō·iˌfish·ənts }

rotation firing [ENG] Setting off explosions so that each hole throws its burden toward the space made by the preceding explosions. { rō'tā·shən ˌfīr·iŋ }

rotation moment *See* torque. { rō'tā·shən ˌmō·mənt }

rotator [MECH] A rotating rigid body. { 'rō ˌtād·ər }

rotor [ELEC] The rotating member of an electrical machine or device, such as the rotating armature of a motor or generator, or the rotating plates of a variable capacitor. [MECH ENG] *See* impeller. { 'rōd·ər }

rough-axed brick *See* axed brick. { 'rəf ˌakst 'brik }

roughcast [CIV ENG] A rough finish on a surface; in particular, a plaster made of lime and shells or pebbles, applied by throwing it against a wall with a trowel. { 'rəfˌkast }

rough cut [ENG] A heavy cut (or cuts) made before the finish cut, the primary object of which is the rapid removal of material. { 'rəf ˌkət }

rough grinding [MECH ENG] Preliminary grinding without regard to finish. { 'rəf 'grīnd·iŋ }

rough hardware [ENG] Utility items such as nails, sash balances, and studs, without attractive finished appearance. { 'rəf 'härdˌwer }

roughing [ENG] The start of evacuation of a vacuum system under test for leaks. { 'rəf·iŋ }

roughing tool [ENG] A single-point cutting tool having a sharp or small-radius nose, used for deep cuts and rapid material removal from the workpiece. { 'rəf·iŋ ˌtül }

rough machining [MECH ENG] Preliminary machining without regard to finish. { 'rəf mə 'shēn·iŋ }

roughness-width cutoff [MECH ENG] The maximum width of surface irregularities included in roughness height measurements. { 'rəf·nəs ¦width 'kəd,ȯf }

rough threading [ENG] **1.** Rapid removal of the bulk of the material in a threading operation. **2.** Roughening a surface prior to hot-metal spraying to enhance adhesions. { 'rəf 'thred·iŋ }

rough turning [MECH ENG] The removal of excess stock from a workpiece as rapidly and efficiently as possible. { 'rəf 'tərn·iŋ }

round [ENG] A series of shots fired either simultaneously or with delay periods between them. { raund }

round-face bit [DES ENG] Any bit with a rounded cutting face. { 'raund ¦fās 'bit }

round file [DES ENG] A file having a circular cross section. { 'raund 'fīl }

round-head bolt [DES ENG] A bolt having a rounded head at one end. { 'raund ¦hed ˌbōlt }

round-head buttress dam [CIV ENG] A mass concrete dam built of parallel buttresses thickened at the upstream end until they meet. { 'raund ¦hed 'bə·trəs ˌdam }

roundnose chisel [DES ENG] A chisel having a rounded cutting edge. { 'raund¦nōs 'chiz·əl }

roundnose tool [DES ENG] A large-radius-nose cutting tool generally used in finishing operations. { 'raund¦nōs 'tül }

round strand rope [DES ENG] A rope composed generally of six strands twisted together or laid to form the rope around a core of hemp, sisal, or manila, or, in a wire-cored rope, around a central strand composed of individual wires. { 'raund ¦strand 'rōp }

round trip [ENG] The combined operations of entering and leaving a hole during drilling operations. { 'raund ¦trip }

rout [MECH ENG] To gouge out, make a furrow, or otherwise machine a wood member. { raut }

route locking [CIV ENG] Electrically locking in position switches, movable point frogs, or derails on the route of a train, after the train has passed a proceed signal. { 'rüt ˌläk·iŋ }

router [DES ENG] **1.** A chisel with a curved point for cleaning out features such as grooves and mortises on wood members. **2.** *See* router plane. [MECH ENG] A machine tool with a rapidly rotating vertical spindle and cutter for making furrows, mortises, and similar grooves. { 'raud·ər }

router plane [DES ENG] A plane for cutting grooves and smoothing the bottom of grooves. Also known as router. { 'raud·ər ˌplān }

route survey [CIV ENG] A survey for the design and construction of linear works, such as roads and pipelines. { 'rüt ˌsərˌvā }

Routh's procedure [MECH] A procedure for modifying the Lagrangian of a system so that the modified function satisfies a modified form of Lagrange's equations in which ignorable coordinates are eliminated. { 'rüths prəˌsē·jər }

Routh's rule of inertia [MECH] The moment of inertia of a body about an axis of symmetry equals $M(a^2 + b^2)/n$, where M is the body's mass, a and b are the lengths of the body's two other perpendicular semiaxes, and n equals 3, 4, or 5 depending on whether the body is a rectangular parallelepiped, elliptic cylinder, or ellipsoid, respectively. { 'raùths 'rül əv i'nər·shə }

routing [ENG] A manufacturing process in which wooden parts are fabricated in various configurations; in high-speed industrial applications, an overhead cutting tool drills into the workpiece and then cuts the desired interior shape. { 'rüd·iŋ }

rowlock course [CIV ENG] A course of bricks laid on their sides so that only their ends are visible. { 'rō,läk ˌkȯrs }
rpm *See* revolution per minute.
rps *See* revolution per second.
RTL *See* resistor-transistor logic.
rubber belt [DES ENG] A conveyor belt that consists essentially of a rubber-covered fabric; fabric is cotton, or nylon or other synthetic fiber, with steel-wire reinforcement. { 'rəb·ər 'belt }
rubber blanket [ENG] A rubber sheet used as a functional die in rubber forming. { 'rəb·ər 'blaŋ·kət }
rubber-covered steel conveyor [DES ENG] A steel conveyor band with a cover of rubber bonded to the steel. { 'rəb·ər ¦kəv·ərd 'stēl kənˌvā·ər }
rubber plating [ENG] The laying down of a rubber coating onto metals by electrodeposition or by ionic coagulation. { 'rəb·ər 'plād·iŋ }
rubber wheel [DES ENG] A grinding wheel made with rubber as the bonding agent. { 'rəb·ər ˌwēl }
rubble [CIV ENG] **1.** Rough, broken stones and other debris resulting from the deterioration and destruction of a building. **2.** Rough stone or brick used in coarse masonry or to fill the space in a wall between the facing courses. { 'rəb·əl }
rubble-mound structure [CIV ENG] A mound of nonselectively formed and placed stones which are protected with a covering layer of selected stones or of specially shaped concrete armored elements. { 'rəb·əl ¦maund ˌstrək·chər }
rubidium magnetometer *See* rubidium-vapor magnetometer. { rü'bid·ē·əm ˌmag·nə'täm·əd·ər }
rubidium-vapor magnetometer [ENG] A highly sensitive magnetometer in which the spin precession principle is combined with optical pumping and monitoring for detecting and recording variations as small as 0.01 gamma (0.1 microoersted) in the total magnetic field intensity of the earth. Also known as rubidium magnetometer. { rü'bid·ē·əm ¦vā·pər ˌmag·nə'täm·əd·ər }
rudder [ENG] **1.** A flat, usually foil-shaped movable control surface attached upright to the stern of a boat, ship, or aircraft, and used to steer the craft. **2.** *See* rudder angle. { 'rəd·ər }
rudder angle [ENG] The acute angle between a ship or plane's rudder and its fore-and-aft line. Also known as rudder. { 'rəd·ər ˌaŋ·gəl }
rule-based control system *See* direct expert control system.
rule of 80-20 *See* Pareto's law. { ¦rül əv 'ād·ē ˌtwen·tē }
ruler [ENG] A graduated strip of wood, metal, or other material, used to measure lines or as a guide in drawing lines. { 'rül·ər }
rumble *See* turntable rumble. { 'rəm·bəl }
run [BUILD] **1.** The horizontal distance from the face of a wall to the ridge of the roof. **2.** The width of a single tread in a stairway. **3.** The horizontal distance traversed by a flight of steps. **4.** The runway or track for a window. [CHEM ENG] **1.** The amount of feedstock processed by a petroleum refinery unit during a given time; often used colloquially in relation to the type of stock being processed, as in crude run or naphtha run. **2.** A processing-cycle or batch-treatment operation. [ENG] A portion of pipe or fitting lying in a straight line in the same direction of flow as the pipe to which it is connected. { rən }
run a line of soundings [ENG] To obtain a series of soundings along a course line. { 'rən ə ¦līn əv 'saund·iŋz }
runaway effect [ELECTR] The phenomenon whereby an increase in temperature causes an increase in a collector-terminal current in a transistor, which in turn results in a higher temperature and, ultimately, failure of the transistor; the effect limits the power output of the transistor. { 'rən·əˌwā iˌfekt }
runback [CHEM ENG] A pipe through which all or part of a distillation column's overhead condensate can be run back into the column, instead of being drawn off as product. [ENG] **1.** To retract the drill feed mechanism to its starting position. **2.** To drill slowly downward toward the bottom of the hole when the drill string has been lifted off-bottom for rechucking. { 'rənˌbak }
rundown line [CHEM ENG] A line from a process unit that connects the look box in the receiving house with the tank in which the product is temporarily stored. { 'rənˌdaün ˌlīn }
rundown tank [CHEM ENG] A tank in which the product from a still, agitator, or other processing equipment is received, and from which the product is pumped to larger storage tanks. Also known as pan tank; receiving tank. { 'rənˌdaün ˌtaŋk }
Runge vector [MECH] A vector which describes certain unchanging features of a nonrelativistic two-body interaction obeying an inverse-square law, either in classical or quantum mechanics; its constancy is a reflection of the symmetry inherent in the inverse-square interaction. { 'rəŋ·əˌvek·tər }
run in [ENG] To lower the assembled drill rods and auxiliary equipment into a borehole. { 'rən 'in }
runner [ENG] In a plastics injection or transfer mold, the channel (usually circular) that connects the sprue with the gate to the mold cavity. { 'rən·ər }
running block *See* traveling block. { 'rən·iŋ ˌblāk }
running bond [CIV ENG] A masonry bond involving the placing of each brick as a stretcher and overlapping the bricks in adjoining courses. { 'rən·iŋ ¦bänd }
running fit [DES ENG] The intentional difference in dimensions of mating mechanical parts that permits them to move relative to each other. { 'rən·iŋ ¦fit }
running gear [MECH ENG] The means employed to support a truck and its load and to provide rolling-friction contact with the running surface. { 'rən·iŋ ˌgir }
running-in [ENG] The process of operating new

or repaired machinery or equipment in order to detect any faults and to ensure smooth, free operation of parts before delivery. { 'rən·iŋ 'in }

run-on *See* dieseling. { 'rənˌȯn }

run-out time [IND ENG] Time required by machine tools after cutting time is finished before tool and material are completely free of interference and before the start of the next sequence of operation. { 'rənˌaůt ˌtīm }

run-time data [MECH ENG] Information obtained from sensors during a machine's regular operation and used to improve its performance. { 'rən ˌtīm 'dad·ə }

runway [CIV ENG] A straight path, often hard-surfaced, within a landing strip, normally used for landing and takeoff of aircraft. { 'rənˌwā }

Rüping process [ENG] A system for preservative treatment of wood by using positive initial pressure, followed by introduction of the preservative and release of air, creating a vacuum. { 'rüp·iŋ ˌprä·səs }

rupture disk device [MECH ENG] A nonreclosing pressure relief device which relieves the inlet static pressure in a system through the bursting of a disk. { 'rəp·chər ˌdisk diˌvīs }

Rushton-Oldshue column [CHEM ENG] A mixing unit used for continuous pipeline blending in which two-phase contacting is desired; it is a column containing separation plates, baffles, and mixing impellers. { 'rəsh·tən 'ōlˌshü ˌkäl·əm }

Russell movable-wall oven [CHEM ENG] An oven for coal carbonization which cokes a 400-pound (180-kilogram) charge in a horizontal, 12-inch-wide (30-centimeter) chamber, heated from both sides, but with one side floating and balanced against scales. { 'rəs·əl ˌmüv·ə·bəl ˌwȯl ˌəv·ən }

rust joint [ENG] A joint to which some oxidizing agent is applied either to cure a leak or to withstand high pressure. { 'rəst ˌjȯint }

rust prevention [ENG] Surface protection of ferrous structures or equipment to prevent formation of iron oxide; can be by coatings, surface treatment, plating, chemicals, cathodic arrangements, or other means. { 'rəst priˌven·chən }

R-value [ENG] An index of the ability of a substance or material to retard the flow of heat; higher numerical values correspond to higher insulating ability. { 'är ˌval·yü }

Rzeppa joint [MECH ENG] A special application of the Bendix-Weiss universal joint in which four large balls are transmitting elements, while a center ball acts as a spacer; it transmits constant angular velocity through a single universal joint. { 'zhep·ə ˌjȯint }

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S

S *See* siemens.

Sabathé's cycle [MECH ENG] An internal combustion engine cycle in which part of the combustion is explosive and part at constant pressure. { ¦sa·bə¦tāz ˌsi·kəl }

saber saw [MECH ENG] A portable saw consisting of an electric motor, a straight saw blade with reciprocating mechanism, a handle, baseplate, and other essential parts. { 'sā·bər ˌsȯ }

saccharimeter [ENG] An instrument for measuring the amount of sugar in a solution, often by determining the change in polarization produced by the solution. { ˌsak·ə'rim·əd·ər }

saccharometer [ENG] An instrument for measuring the amount of sugar in a solution, by determining either the specific gravity or the gases produced by fermentation. { ˌsak·ə'räm·əd·ər }

sacrificial compliant substrate *See* compliant substrate. { ˌsak·rə¦fish·əl kəm¦plī·ənt 'səbˌstrāt }

saddle [DES ENG] A support shaped to fit the object being held. { 'sad·əl }

saddle-type turret lathe [MECH ENG] A turret lathe designed without a ram and with the turret mounted directly on a support (saddle) which slides on the bedways of the lathe. { 'sad·əl ¦tīp 'tər·ət ˌlāth }

SAE number [ENG] A classification of motor, transmission, and differential lubricants to indicate viscosities, standardized by the Society of Automotive Engineers; SAE numbers do not connote quality of the lubricant. { ˌeˌsā'ē ˌnəm·bər }

safe load [MECH] The stress, usually expressed in tons per square foot, which a soil or foundation can safely support. { 'sāf ˌlōd }

safety [ENG] Methods and techniques of avoiding accident or disease. { 'sāf·tē }

safety belt [ENG] A strong strap or harness used to fasten a person to an object, such as the seat of an airplane or automobile. { 'sāf·tē ˌbelt }

safety bolt [CIV ENG] A bolt that can be opened from only one side of the door or gate it fastens. { 'sāf·tē ˌbōlt }

safety can [ENG] A cylindrical metal container used for temporary storage or handling of flammable liquids, such as gasoline, naphtha, and benzine, in buildings not provided with properly constructed storage rooms; these cans are also used to transport such liquids for filling and supply purposes within local areas. { 'sāf·tē ˌkan }

safety chuck [DES ENG] Any drill chuck on which the heads of the set screws do not protrude beyond the outer periphery of the chuck. { 'sāf·tē ˌchək }

safety engineer [IND ENG] A person who inspects all possible danger spots in a factory, mine, or other industrial building or plant. { 'sāf·tē ˌen·jə'nir }

safety engineering [IND ENG] The testing and evaluating of equipment and procedures to prevent accidents. { 'sāf·tē ˌen·jə'nir·iŋ }

safety factor [ELEC] The amount of load, above the normal operating rating, that a device can handle without failure. [MECH] *See* factor of safety. { 'sāf·tē ˌfak·tər }

safety flange [DES ENG] A type of flange with tapered sides designed to keep a wheel intact in the event of accidental breakage. { 'sāf·tē ˌflanj }

safety fuse [ENG] A train of black powder which is enclosed in cotton, jute yarn, and waterproofing compounds, and which burns at the rate of 2 feet (60 centimeters) per minute; it is used mainly for small-scale blasting. { 'sāf·tē ˌfyüz }

safety hoist [MECH ENG] A hoisting gear that does not continue running when tension is released. { 'sāf·tē ˌhȯist }

safety hook [DES ENG] A hoisting hook with a spring-loaded latch that prevents the load from accidentally slipping off the hook. { 'sāf·tē ˌhůk }

safety level of supply [IND ENG] The quantity of material, in addition to the operating level of supply, required to be on hand to permit continuous operations in the event of minor interruption of normal replenishment or unpredictable fluctuations in demand. { 'sāf·tē 'lev·əl əv sə'plī }

safety match [ENG] A match that can be ignited only when struck against a specially made friction surface. { 'sāf·tē ˌmach }

safety plug [ENG] A protective device used on a heated pressure vessel (for example, a steam boiler), and containing a fusible element that melts at a predetermined safe temperature to prevent the buildup of excessive pressure. Also known as fusible plug. { 'sāf·tē ˌpləg }

safety rail *See* guardrail. { 'sāf·tē ˌrāl }

safety relief valve *See* safety valve. { 'sāf·tē ri'lēf ˌvalv }

safety shoe [ENG] A special shoe without spark-producing nails or plates, worn by personnel working around explosives. { 'sāf·tē ˌshü }

safety stop [MECH ENG] **1.** On a hoisting apparatus, a device by which the load may be prevented from falling. **2.** An automatic device on a hoisting engine designed to prevent overwinding. { 'sāf·tē ˌstäp }

safety time [IND ENG] The difference between the time when a certain material will be required and the time when the material will actually be in stock. { 'sāf·tē ˌtīm }

safety valve [MECH ENG] A spring-loaded, pressure-actuated valve that allows steam to escape from a boiler at a pressure slightly above the safe working level of the boiler; fitted by law to all boilers. Also known as safety relief valve. { 'sāf·tē ˌvalv }

safe yield [CIV ENG] The maximum dependable draft that can be made continuously upon a source of water supply over a given period of time during which the probable driest period, and therefore period of greatest deficiency in water supply, is likely to occur. { 'sāf 'yēld }

Saint Venant's compatibility equations [MECH] Equations for the components e_{ij} of the strain tensor that follow from their integrability, namely, $(e_{ij})_{kl} + (e_{kl})_{ij} - (e_{ik})_{jl} - (e_{jl})_{ik} = 0$, where i, j, k, and l can take on any of the values x, y, and z, and subscripts outside the parentheses indicate partial differentiation. { ˌsän·və'nänz kəmˌpad·ə'bil·əd·ē iˌkwā·shənz }

Saint Venant's principle [MECH] The principle that the strains that result from application, to a small part of a body's surface, of a system of forces that are statically equivalent to zero force and zero torque become negligible at distances which are large compared with the dimensions of the part. { ˌsän·və'nänz 'prin·sə·pəl }

salamander stove [ENG] A small portable stove used for temporary or emergency heat; for example, on construction sites or in greenhouses. { 'sal·əˌman·dər 'stōv }

salimeter [ENG] A hydrometer graduated to read directly the percentage of salt in a solution such as brine. { sə'lim·əd·ər }

salina *See* saltworks. { sə'lē·nə }

saline-water reclamation [CHEM ENG] Purification and removal of salts from brine or brackish water by ion exchange, crystallization, distillation, evaporation, and reverse osmosis. { 'sāˌlēn 'wȯd·ər ˌrek·ləˌmā·shən }

salinity-temperature-depth recorder [ENG] An instrument consisting of sensing elements usually lowered from a stationary ship, and a recorder on board which simultaneously records measurements of temperature, salinity, and depth. Also known as CTD recorder; STD recorder. { sə'lin·əd·ē 'tem·prə·chər 'depth riˌkȯrd·ər }

salinometer [ENG] An instrument that measures water salinity by means of electrical conductivity or by a hydrometer calibrated to give percentage of salt directly. { ˌsal·ə'näm·əd·ər }

salt [ENG] To add an accelerator or retardant to cement. { sȯlt }

salt-effect distillation [CHEM ENG] A process of extractive distillation in which a salt that is soluble in the liquid phase of the system being separated is used as a separating agent. { 'sȯlt iˌfekt ˌdis·tə¦lā·shən }

saltern *See* salt garden; saltworks. { 'sȯl·tərn }

salt garden [ENG] A large, shallow basin or pond where sea water is evaporated by solar heat. Also known as saltern. { 'sȯlt ˌgärd·ən }

salt glaze [ENG] Glaze formed on the surface of stoneware by putting salt into the kiln during firing. { 'sȯlt ˌglāz }

salt-gradient solar pond *See* solar pond. { ¦sȯlt ¦grād·ē·ənt ¦sō·lər 'pänd }

salt grainer [CHEM ENG] Type of evaporative crystallizer in which the solution is kept hot, and supersaturation is developed by evaporation rather than by cooling. { 'sȯlt ˌgrān·ər }

salting-out effect [CHEM ENG] The growth of crystals of a substance on heated, liquid-holding surfaces of a crystallizing evaporator as a result of the decrease in solubility of the substance with increase in temperature. { 'sȯl·tiŋ ¦aůt iˌfekt }

salt velocity meter [ENG] A rate-of-flow volume meter used to find the transit time of passage between two fixed points of a small quantity of salt or radioactive isotope in a flowing stream by measuring electrical conductivity or radiation level at those points. { 'sȯlt və'läs·əd·ē ˌmēd·ər }

salt well [ENG] A bored or driven well from which brine is obtained. { 'sȯlt ˌwel }

saltworks [ENG] A building or group of buildings where salt is produced commercially, as by extraction from sea water or from the brine of salt springs. Also known as salina; saltern. { 'sȯltˌwərks }

salvage procedure [ENG] The recovery, evacuation, and reclamation of damaged, discarded, condemned, or abandoned material, ships, craft, and floating equipment for reuse, repair, refabrication, or scrapping. { 'sal·vij prəˌsē·jər }

salvage value [ENG] **1.** The cost that could be recovered from the sale of used equipment when removed or scrapped. **2.** The actual market value of a specific facility or equipment at a particular point in time. { 'sal·vij ˌval·yü }

sample-and-hold circuit [ELECTR] A circuit that measures an input signal at a series of definite times, and whose output remains constant at a value corresponding to the most recent measurement until the next measurement is made. { ¦sam·pəl ən 'hōld ˌsər·kət }

sampled-data control system [CONT SYS] A form of control system in which the signal appears at one or more points in the system as a sequence of pulses or numbers usually equally

spaced in time. { 'sam·pəld ¦dad·ə kən'trōl ˌsis·təm }

sample log [ENG] Record of core samples or drill cuttings; gives geological, visual, and hydrocarbon-content record versus depth of drilling. { 'sam·pəl ˌläg }

sampler [CONT SYS] A device, used in sampled-data control systems, whose output is a series of impulses at regular intervals in time; the height of each impulse equals the value of the continuous input signal at the instant of the impulse. [ENG] A mechanical or other device designed to obtain small samples of materials for analysis; used in biology, chemistry, and geology. { 'sam·plər }

sample splitter [ENG] An instrument, generally constructed of acrylic resin, designed to subdivide a total sample of marine plankton while maintaining a quantitatively correct relationship between the various phyla in the sample. { 'sam·pəl ˌsplid·ər }

sampling [ENG] Process of obtaining a sequence of instantaneous values of a wave. { 'sam·pliŋ }

sampling bottle [ENG] A cylindrical container, usually closed at a chosen depth, to trap a water sample and transport it to the surface without introducing contamination. { 'sam·pliŋ ˌbäd·əl }

sampling gate [ELECTR] A gate circuit that extracts information from the input waveform only when activated by a selector pulse. { 'sam·pliŋ ˌgāt }

sampling interval [CONT SYS] The time between successive sampling pulses in a sampled-data control system. { 'sam·pliŋ ˌin·tər·vəl }

sampling plan [IND ENG] A plan stating sample sizes and the criteria for accepting or rejecting items or taking another sample during inspection of a group of items. { 'sam·pliŋ ˌplan }

sampling probe [ENG] A leak-testing probe which collects tracer gas from the test area of an object under pressure and feeds it to the leak detector at reduced pressure. { 'sam·pliŋ ˌprōb }

sampling process [ENG] The process of obtaining a sequence of instantaneous values of some quantity that varies continuously with time. { 'sam·pliŋ ˌprä·səs }

sampling rate [ENG] The rate at which measurements of physical quantities are made; for example, if it is desired to calculate the velocity of a missile and its position is measured each millisecond, then the sampling rate is 1000 measurements per second. { 'sam·pliŋ ˌrāt }

sampling risk [IND ENG] In inspection procedure, the probability, under the sampling plan used, that acceptable material will be rejected or that unsatisfactory material will be accepted. { 'sam·pliŋ ˌrisk }

sampling synthesis [ENG ACOUS] Any method of synthesizing musical tones that is based on playing back digitally recorded sounds. { 'sam·pliŋ ˌsin·thə·səs }

sampling time [ENG] The time between successive measurements of a physical quantity. { 'sam·pliŋ ˌtīm }

sampling voltmeter [ENG] A special type of voltmeter that detects the instantaneous value of an input signal at prescribed times by means of an electronic switch connecting the signal to a memory capacitor; it is particularly effective in detecting high-frequency signals (up to 12 gigahertz) or signals mixed with noise. { 'sam·pliŋ 'vōlt,mēd·ər }

samson post *See* king post. { 'sam·sən ˌpōst }

sandbag [ENG] A bag filled with sand; used to build temporary protective walls. { 'san,bag }

sandblasting [ENG] Surface treatment in which steel grit, sand, or other abrasive material is blown against an object to produce a roughened surface or to remove dirt, rust, and scale. { 'san ˌblast·iŋ }

sand drain [CIV ENG] A vertical boring through a clay or silty soil filled with sand or gravel to facilitate drainage. { 'san ˌdrān }

sander [MECH ENG] **1.** An electric machine used to sand the surface of wood, metal, or other material. **2.** A device attached to a locomotive or electric rail car which sands the rails to increase friction on the driving wheels. { 'san·dər }

sand filter [CIV ENG] A filter consisting of graded layers of sand and aggregate for purifying domestic water. { 'san ˌfil·tər }

sand finish [ENG] A smooth finish on a plaster surface made by rubbing the sand or mortar coat. { 'san ˌfin·ish }

sand heap analogy *See* sand hill analogy. { 'sand ˌhēp əˌnal·ə·jē }

sand hill analogy [MECH] A formal identity between the differential equation and boundary conditions for a stress function for torsion of a perfectly plastic prismatic bar, and those for the height of the surface of a granular material, such as dry sand, which has a constant angle of rest. Also known as sand heap analogy. { 'sand ˌhil əˌnal·ə·jē }

sandhog [ENG] A worker in compressed-air environments, as in driving tunnels by means of pneumatic caissons. { 'sanˌhäg }

sanding [ENG] **1.** Covering or mixing with sand. **2.** Smoothing a surface with sandpaper or other abrasive paper or cloth. { 'sand·iŋ }

sand line [ENG] A wire line used to raise and lower a bailer or sand pump to remove cuttings from a borehole. { 'san ˌlīn }

sand mill [MECH ENG] Variation of a ball-type size-reduction mill in which grains of sand serve as grinding balls. { 'san ˌmil }

sand pile [CIV ENG] A compacted filling of sand in a deep round hole formed by ramming the sand with a pile; used for foundations in soft soil. { 'san ˌpīl }

sandpit [CIV ENG] An excavation dug in sand, especially as a source of sand for construction materials. { 'sanˌpit }

sand pump [MECH ENG] A pump, usually a centrifugal type, capable of handling sand- and

gravel-laden liquids without clogging or wearing unduly; used to extract mud and cuttings from a borehole. Also known as sludge pump. { 'san ˌpəmp }

sand reel [MECH ENG] A drum, operated by a band wheel, for raising or lowering the sand pump or bailer during drilling operations. Also known as coring reel. { 'san ˌrēl }

sand slinger [MECH ENG] A machine which delivers sand to and fills molds at high speed by centrifugal force. { 'san ˌsliŋ·ər }

sand trap [ENG] A device in a conduit for trapping sand or soil particles carried by the water. { 'san ˌtrap }

sand wheel [MECH ENG] A wheel fitted with steel buckets around the circumference for lifting sand or sludge out of a sump to stack it at a higher level. { 'san ˌwēl }

sandwich beam *See* flitch girder. { 'sanˌwich ˌbēm }

sandwich construction [DES ENG] Composite construction of alloys, plastics, wood, or other materials consisting of a foam or honeycomb layer laminated and glued between two hard outer sheets. Also known as sandwich laminate. { 'sanˌwich kənˌstrək·shən }

sandwich heating [ENG] Method for heating both sides of a thermoplastic sheet simultaneously prior to forming or shaping. { 'sanˌwich ˌhēd·iŋ }

sandwich laminate *See* sandwich construction. { 'sanˌwich 'lam·ə·nət }

sandwich molding *See* coinjection molding. { 'sanˌwich ˌmōld·iŋ }

sanitary engineering [CIV ENG] A field of civil engineering concerned with works and projects for the protection and promotion of public health. { 'san·əˌter·ē ˌen·jə'nir·iŋ }

sanitary landfill [CIV ENG] The disposal of garbage by spreading it in layers covered with soil or ashes to a depth sufficient to control rats, flies, and odors. { 'san·əˌter·ē 'lanˌfil }

sanitary sewer [CIV ENG] A sewer which is restricted to carrying sewage and to which storm and surface waters are not admitted. { 'san·əˌter·ē 'sü·ər }

sanitation [CIV ENG] The act or process of making healthy environmental conditions. { ˌsan·ə'tā·shən }

Sargent cycle [THERMO] An ideal thermodynamic cycle consisting of four reversible processes: adiabatic compression, heating at constant volume, adiabatic expansion, and isobaric cooling. { 'sär·jənt ˌsī·kəl }

sarking [BUILD] A layer of boards or bituminous felt placed beneath tiles or other roofing to provide thermal insulation or to prevent ingress of water. { 'särk·iŋ }

SASAR *See* segmented aperture-synthetic aperture radar. { 'sāˌsär }

sash [BUILD] A frame for window glass. { sash }

sash bar [BUILD] One of the strips of wood or metal that separate the panes of glass in a window. Also known as glazing bar; muntin; window bar. { 'sash ˌbär }

sash cord [BUILD] A cord or chain used to attach a counterweight to the window sash. { 'sash ˌkȯrd }

satellite and missile surveillance [ENG] The systematic observation of aerospace for the purpose of detecting, tracking, and characterizing objects, events, and phenomena associated with satellites and inflight missiles, friendly and enemy. { ¦sad·əl¦īt ən ¦mis·əl sər'vā·ləns }

saturable-core magnetometer [ENG] A magnetometer that depends for its operation on the changes in permeability of a ferromagnetic core as a function of the magnetic field to be measured. { 'sach·rə·bəl ¦kȯr ˌmag·nə'täm·əd·ər }

saturated vapor [THERMO] A vapor whose temperature equals the temperature of boiling at the pressure existing on it. { 'sach·əˌrād·əd 'vā·pər }

saturation [ELECTR] **1.** The condition that occurs when a transistor is driven so that it becomes biased in the forward direction (the collector becomes positive with respect to the base, for example, in a *pnp* type of transistor). **2.** *See* anode saturation; temperature saturation. { ˌsach·ə'rā·shən }

saturation specific humidity [THERMO] A thermodynamic function of state; the value of the specific humidity of saturated air at the given temperature and pressure. { ˌsach·ə'rā·shən spə'sif·ik hyü'mid·əd·ē }

saturation vapor pressure [THERMO] The vapor pressure of a thermodynamic system, at a given temperature, wherein the vapor of a substance is in equilibrium with a plane surface of that substance's pure liquid or solid phase. { ˌsach·ə'rā·shən 'vā·pər ˌpresh·ər }

saturator [ENG] A device, equipment, or person that saturates one material with another; examples are a tank in which vapors become saturated with ammonia from coal (in carbonization of coal), a humidifier, and the operator of a machine for impregnating roofing felt with asphalt. { ˌsach·əˌrād·ər }

Saunders air-lift pump [MECH ENG] A device for raising water from a well by the introduction of compressed air below the water level in the well. { 'sȯn·dərz 'er ˌlift ˌpəmp }

sauterelle [ENG] A device used by masons for tracing and forming angles. { ˌsōd·ə'rel }

Savonius rotor [MECH ENG] A rotor composed of two offset semicylindrical elements rotating about a vertical axis. { sə'vō·nē·əs 'rōd·ər }

Savonius windmill [MECH ENG] A windmill composed of two semicylindrical offset cups rotating about a vertical axis. { sə'vō·nē·əs 'winˌmil }

saw [DES ENG] **1.** Any of various tools consisting of a thin, usually steel, blade with continuous cutting teeth on the edge. **2.** Any similar device or tool, such as arotating disc, in which a sharp continuous edge replaces the teeth. { sȯ }

saw bit [DES ENG] A bit having a cutting edge formed by teeth shaped like those in a handsaw. { 'sȯ ˌbit }

saw gumming [MECH ENG] Grinding away the punch marks in the spaces between the teeth in saw manufacture. { 'sȯ ˌgəm·iŋ }

sawhorse [ENG] A wooden rack used to support wood that is being sawed. { 'sȯˌhȯrs }

sawing [ENG] Cutting with a saw. { 'sȯ·iŋ }

sawmill [IND ENG] A plant that houses sawing machines. [MECH ENG] A machine for cutting logs with a saw or a series of saws. { 'sȯˌmil }

sawtooth barrel *See* basket. { 'sȯˌtüth 'bar·əl }

sawtooth crusher [MECH ENG] Solids crusher in which feed is broken down between two saw-toothed shafts rotating at different speeds. { 'sȯˌtüth 'krəsh·ər }

sawtooth waveform [ELECTR] A waveform characterized by a slow rise time and a sharp fall, resembling a tooth of a saw. { 'sȯˌtüth 'wāv ˌfȯrm }

sax [DES ENG] A tool for chopping away the edges of roof slates; it has a pick at one end for making nail holes. { saks }

Saybolt color [ENG] A color standard for petroleum products determined with a Saybolt chromometer. { 'sāˌbōlt ˌkəl·ər }

Saybolt Furol viscosimeter [ENG] An instrument for measuring viscosity of very thick fluids, for example, heavy oils; similar to the Saybolt Universal viscosimeter, but with a larger-diameter tube so that the efflux time is about one-tenth that of the Universal instrument. { 'sāˌbōlt 'fyüˌrȯl ˌvis·kə'sim·əd·ər }

Saybolt Universal viscosimeter [ENG] An instrument for measuring viscosity by the time it takes a fluid to flow through a calibrated tube; used for the lighter petroleum products and lubricating oils. { 'sāˌbōlt ˌyü·nə'vər·səl ˌvis·kə'sim·əd·ər }

scab [BUILD] A short, flat piece of lumber that is used to splice two pieces of wood set at right angles to each other. { skab }

SCADA *See* supervisory control and data acquisition. { 'skad·ə or ˌesˌsēˌāˌdē'ā }

scaffold [CIV ENG] A temporary or movable platform supported on the ground or suspended; used for working at considerable heights above the ground. { 'skaˌfōld }

scale [ENG] **1.** A series of markings used for reading the value of a quantity or setting. **2.** To change the magnitude of a variable in a uniform way, as by multiplying or dividing by a constant factor, or the ratio of the real thing's magnitude to the magnitude of the model or analog of the model. **3.** A weighing device. **4.** A ruler or other measuring stick. **5.** A dense deposit bonded on the surface of a tube in a heat exchanger or on the surface of an evaporating device. { skāl }

scale factor [ENG] The factor by which the reading of an instrument or the solution of a problem should be multiplied to give the true final value when a corresponding scale factor is used initially to bring the magnitude within the range of the instrument or computer. { 'skāl ˌfak·tər }

scaler [ELECTR] A circuit that produces an output pulse when a prescribed number of input pulses is received. Also known as counter; scaling circuit. { skāl·ər }

scale-up [DES ENG] Design process in which the data of an experimental-scale operation (model or pilot plant) is used for the design of a large (scaled-up) unit, usually of commercial size. [IND ENG] Transfer of a new process from a pilot plant operation to production at commercial levels. { 'skālˌəp }

scaling [ELECTR] Counting pulses with a scaler when the pulses occur too fast for direct counting by conventional means. [ENG] Removing scale (rust or salt) from a metal or other surface. [MECH] Expressing the terms in an equation of motion in powers of nondimensional quantities (such as a Reynolds number), so that terms of significant magnitude under conditions specified in the problem can be identified, and terms of insignificant magnitude can be dropped. { 'skāl·iŋ }

scaling circuit *See* scaler. { 'skāl·iŋ ˌsər·kət }

scaling factor [ELECTR] The number of input pulses per output pulse of a scaling circuit. Also known as scaling ratio. [ENG] Factor used in heat-exchange calculations to allow for the loss in heat conductivity of a material because of the development of surface scale, as inside pipelines and heat-exchanger tubes. { 'skāl·iŋ ˌfak·tər }

scaling ratio [ELECTR] *See* scaling factor. [ENG] The ratio of a certain property of a laboratory model to the same property in the natural prototype. { 'skāl·iŋ ˌrā·shō }

scalpel [DES ENG] A small, straight, very sharp knife (or detachable blade for a knife), used for dissecting. { 'skal·pəl }

scan [ELECTR] The motion, usually periodic, given to the major lobe of an antenna; the process of directing the radio-frequency beam successively over all points in a given region of space. [ENG] **1.** To examine an area, a region in space, or a portion of the radio spectrum point by point in an ordered sequence; for example, conversion of a scene or image to an electric signal or use of radar to monitor an airspace for detection, navigation, or traffic control purposes. **2.** One complete circular, up-and-down, or left-to-right sweep of the radar, light, or other beam or device used in making a scan. { skan }

scanner [ENG] **1.** Any device that examines an area or region point by point in a continuous systematic manner, repeatedly sweeping across until the entire area or region is covered; for example, a flying-spot scanner. **2.** A device that automatically samples, measures, or checks a number of quantities or conditions in sequence, as in process control. { 'skan·ər }

scanning proton microprobe [ENG] An instrument used for determining the spatial distribution of trace elements in samples, in which a

beam of energetic protons is focused on a narrow spot which is swept over the sample, and the characteristic x-rays emitted from the target are measured. { 'skan·iŋ 'prōˌtän 'mī·krəˌskōp }

scanning radiometer [ENG] An image-forming system consisting of a radiometer which, by the use of a plane mirror rotating at 45° to the optical axis, can see a circular path normal to the instrument. { 'skan·iŋ ˌrād·ē'äm·əd·ər }

scanning sequence [ENG] The order in which the points in a region are scanned; for example, in television the picture is scanned horizontally from left to right and vertically from top to bottom. { 'skan·iŋ ˌsēk·wəns }

scanning sonar [ENG] Sonar in which all targets of interest are shown simultaneously, as on a radar PPI (plan position indicator) display or sector display; the sound pulse may be transmitted in all directions simultaneously and picked up by a rotating receiving transducer, or transmitted and received in only one direction at a time by a scanning transducer. { 'skan·iŋ 'sōˌnär }

scantlings [BUILD] Sections of timber measuring less than 8 inches (20 centimeters) wide and from 2 to 6 inches (5 to 15 centimeters) thick; used for studding. { 'skant·liŋz }

scarf joint [DES ENG] A joint made by the cutting of overlapping mating parts so that the joint is not enlarged and the patterns are complementary, and securing them by glue, fasteners, welding, or other joining method. { 'skärf ˌjȯint }

scarifier [ENG] An implement or machine with downward projecting tines for breaking down a road surface 2 feet (60 centimeters) or less. { 'skär·əˌfī·ər }

scatterometer [ENG] A microwave sensor that is essentially a radar without ranging circuits, used to measure only the reflection or scattering coefficient while scanning the surface of the earth from an aircraft or a satellite. { ˌskad·əˈräm·əd·ər }

scavenging [MECH ENG] Removal of spent gases from an internal combustion engine cylinder and replacement by a fresh charge or air. { 'skav·ən·jiŋ }

scenario-based design [SYS ENG] A family of techniques in which the use of a future system is concretely described at an early point in the development process, and narrative descriptions of the envisage usage episodes are then employed in a variety of ways to guide the development of the system. { səˈner·ē·ō ˌbāst diˈzīn }

scend [ENG] **1.** The upward motion of the bow and stern of a vessel associated with pitching. **2.** The lifting of the entire vessel by waves or swell. Also known as send. { send }

scheduling [IND ENG] A decision-making function that plays an important role in most manufacturing and service industries and often allows an organization to operate with a minimum of resources. Scheduling is applied in procurement and production, in transportation and distribution, and in information processing and communication. In manufacturing, the scheduling function coordinates the flow of parts and products through the system, and balances the workload on machines and personnel, departments, and the entire plant. { 'skej·əl·iŋ }

Scheffel engine [MECH ENG] A type of multirotor engine that uses nine approximately equal rotors turning in the same clockwise sense. { 'shef·əl ˌen·jēn }

Scheibel column *See* Scheibel extractor. { 'shī·bəl ˌkäl·əm }

Scheibel extractor [CHEM ENG] Liquid-liquid contact vessel used in liquid-liquid extraction processes: a vertical cylinder with interspersed open spaces and wire-mesh packing along its height, with liquid agitators in the open spaces, or a vertical cylinder fully filled with wire-mesh packing. Also known as Scheibel column; Scheibel-York extractor; York-Scheibel column. { 'shī·bəl ikˌstrak·tər }

Scheibel-York extractor *See* Scheibel extractor. { 'shī·bəl 'yȯrk ikˌstrak·tər }

schematic circuit diagram *See* circuit diagram. { skiˈmad·ik 'sər·kət ˌdī·əˌgram }

Schleiermacher's method [THERMO] A method of determining the thermal conductivity of a gas, in which the gas is placed in a cylinder with an electrically heated wire along its axis, and the electric energy supplied to the wire and the temperatures of wire and cylinder are measured. { 'shlī·ərˌmäk·ərz ˌmeth·əd }

Schlumberger dipmeter [ENG] An instrument that measures both the amount and direction of dip by readings taken in the borehole; it consists of a long, cylindrical body with two telescoping parts and three long, springy metal strips, arranged symmetrically round the body, which press outward and make contact with the walls of the hole. { 'shləm·bərˌzhā 'dipˌmēd·ər }

Schlumberger photoclinometer [ENG] An instrument that measures simultaneously the amount and direction of the deviation of a borehole; the sonde, designed to lie exactly parallel to the axis of the borehole, is fitted with a small camera on the axis of a graduated glass bowl, in which a steel ball rolls freely and a compass is mounted in gimbals; the camera is electrically operated from the surface and takes a photograph of the bowl, the steel ball marks the amount of deviation, and the position in relation to the image of the compass needle gives the direction of deviation. { 'shləm·bərˌzhā ˌfōd·ō·kliˈnäm·əd·ər }

Schmidt field balance [ENG] An instrument that operates as both a horizontal and vertical field balance and consists of a permanent magnet pivoted on a knife edge. { 'shmit 'fēld ˌbal·əns }

Schneider recoil system [MECH ENG] A recoil system for artillery, employing the hydropneumatic principle without a floating piston. { 'shnī·dər 'rēˌkȯil ˌsis·təm }

Schoenherr-Hessberger process [CHEM ENG] A nitrogen-fixation process used in Norway; employs a very long (22 feet or 7 meters) alternating-current arc around which air moves in a helical

path in a 746-kilowatt furnace. { 'shən·her 'hes,bərg·ər ,prä·səs }

Schoop process [ENG] A process for coating surfaces by spraying with high-velocity molten metal particles. { shōp ,prä·səs }

Schottky barrier [ELECTR] A transition region formed within a semiconductor surface to serve as a rectifying barrier at a junction with a layer of metal. { 'shät·kē ,bar·ē·ər }

Schottky barrier diode [ELECTR] A semiconductor diode formed by contact between a semiconductor layer and a metal coating; it has a nonlinear rectifying characteristic; hot carriers (electrons for *n*-type material or holes for *p*-type material) are emitted from the Schottky barrier of the semiconductor and move to the metal coating that is the diode base; since majority carriers predominate, there is essentially no injection or storage of minority carriers to limit switching speeds. Also known as hot-carrier diode; Schottky diode. { 'shät·kē ¦bar·ē·ər 'dī,ōd }

Schottky diode *See* Schottky barrier diode. { 'shät·kē 'dī,ōd }

Schottky-diode FET logic [ELECTR] A logic gate configuration used with gallium-arsenide field-effect transistors operating in the depletion mode, in which very small Schottky diodes at the gate input provide the logical OR function and the level shifting required to make the input and output voltage levels compatible. Abbreviated SDFL. { 'shät·kē ¦dī,ōd ¦ef¦ē¦tē 'läj·ik }

Schottky noise *See* shot noise. { 'shät·kē ,nȯiz }

Schottky transistor-transistor logic [ELECTR] A transistor-transistor logic circuit in which a Schottky diode with forward diode voltage is placed across the base-collector junction of the output transistor in order to improve the speed of the circuit. { 'shät·kē tran¦zis·tər tran¦zis·tər 'läj·ik }

Schuler pendulum [MECH] Any apparatus which swings, because of gravity, with a natural period of 84.4 minutes, that is, with the same period as a hypothetical simple pendulum whose length is the earth's radius; the pendulum arm remains vertical despite any motion of its pivot, and the apparatus is therefore useful in navigation. { 'shü·lər ,pen·jə·ləm }

Schuler tuning [ENG] The designing of gyroscopic devices so that their periods of oscillation will be about 84.4 minutes. { 'shü·lər ,tün·iŋ }

Schweydar mechanical detector [ENG] A seismic detector that senses and records refracted waves; a lead sphere is suspended by a flat spring, the sphere's motion is magnified by an aluminum cone that moves a bow around a spindle carrying a mirror, and this motion is then photographically recorded. { 'shwād·ər mi¦kan·i·kəl di'tek·tər }

scissor engine *See* cat-and-mouse engine. { 'siz·ər ,en·jən }

scissor jack [MECH ENG] A lifting jack driven by a horizontal screw; the linkages of the jack are parallelograms whose horizontal diagonals are lengthened or shortened by the screw. { 'siz·ər ,jak }

scissors bridge [CIV ENG] A light metal bridge that can be folded and carried by a military tank. { 'siz·ərz ,brij }

scissors crossover [CIV ENG] A scissor-shaped junction between two parallel railway tracks. Also called double crossover. { 'siz·ərz 'krȯs,ō·vər }

scissors truss [BUILD] A roof truss in which the braces cross like scissors blades. { 'siz·ərz ,trəs }

sclerometer [ENG] An instrument used to determine the hardness of a material by measuring the pressure needed to scratch or indent a surface with a diamond point. { skla'räm·əd·ər }

scleroscope [ENG] An instrument used to determine the hardness of a material by measuring the height to which a standard ball rebounds from its surface when dropped from a standard height. { 'skler·ə,skōp }

scoop [DES ENG] **1.** Any of various ladle-, shovel-, or bucketlike utensils or containers for moving liquid or loose materials. **2.** A funnel-shaped opening for channeling a fluid into a desired path. *See* ellipsoidal floodlight. [MECH ENG] A large shovel with a scoop-shaped blade. { sküp }

scoopfish *See* underway sampler. { 'süp,fish }

scope [ELECTR] *See* cathode-ray oscilloscope; radarscope. [ENG] The work that will actually be done on a project as documented by the terms in a contract. { skōp }

scorching [CHEM ENG] Premature vulcanization caused by heat during the processing of rubber. [ENG] **1.** Burning an exposed surface so as to change color, texture, or flavor without consuming. **2.** Destroying by fire. { 'skȯrch·iŋ }

scorch time [CHEM ENG] In rubber manufacture, the time during which a rubber compound can be worked at a given temperature before curing begins. { 'skȯrch ,tīm }

scoring [ENG] Scratching the surface of a material. { 'skȯr·iŋ }

scoring test *See* L-2 test. { 'skȯr·iŋ ,test }

scotch [DES ENG] *See* scutch. [ENG] A wooden stopblock or iron catch placed under a wheel or other curved object to prevent slipping or rolling. { skäch }

scotch boiler [MECH ENG] A fire-tube boiler with one or more cylindrical internal furnaces enveloped by a boiler shell equipped with five tubes in its upper part; heat is transferred to water partly in the furnace area and partly in passage of hot gases through the tubes. Also known as dry-back boiler; scotch marine boiler (marine usage). { 'skäch 'bȯil·ər }

Scotch bond *See* American bond. { 'skäch 'bänd }

Scotch derrick *See* stiffleg derrick. { 'skäch 'der·ik }

scotch marine boiler *See* scotch boiler. { 'skäch mə¦rēn 'bȯil·ər }

Scotch yoke [MECH ENG] A type of four-bar

linkage; it is employed to convert a steady rotation into a simple harmonic motion. { 'skäch 'yōk }

Scott connection [ELECTR] A type of transformer which transmits power from two-phase to three-phase systems, or vice versa. { 'skät kə,nek·shən }

Scott-Darey process [CIV ENG] A chemical precipitation method used for fine solids removal in sewage plants; employs ferric chloride solution made by treating scrap iron with chlorine. { 'skät 'der·ē ,prä·səs }

scouring [ENG] Physical or chemical attack on process equipment surfaces, as in a furnace or fluid catalytic cracker. [MECH ENG] Mechanical finishing or cleaning of a hard surface by using an abrasive and low pressure. { 'skaůr·iŋ }

scouring basin [CIV ENG] A basin containing impounded water which is released at about low water in order to maintain the desired depth in the entrance channel. Also known as sluicing pond. { 'skaůr·iŋ ,bas·ən }

scout [ENG] An engineer who makes a preliminary examination of promising oil and mining claims and prospects. { skaůt }

scrambler [ELECTR] A circuit that divides speech frequencies into several ranges by means of filters, then inverts and displaces the frequencies in each range so that the resulting reproduced sounds are unintelligible; the process is reversed at the receiving apparatus to restore intelligible speech. Also known as speech inverter; speech scrambler. { 'skram·blər }

scrap [ENG] Any solid material cutting or reject of a manufacturing operation, which may be suitable for recycling as feedstock to the primary operation; for example, scrap from plastic or glass molding or metalworking. { skrap }

scraped-surface exchanger [CHEM ENG] A liquid-liquid heat-exchange device that has a rotating element with spring-loaded scraper blades to wipe the process-fluid exchange surfaces clean of crystals or other foulants; used in paraffin-wax processing. { 'skrāpt ¦sər·fəs iks,chān·jər }

scraper conveyor [MECH ENG] A type of flight conveyor in which the element (chain and flight) for moving materials rests on a trough. { 'skrāp·ər kən,vā·ər }

scraper hoist [MECH ENG] A drum hoist that operates the scraper of a scraper loader. { 'skrāp·ər ,hȯist }

scraper loader [MECH ENG] A machine used for loading coal or rock by pulling a scoop through the material to an apron or ramp, where the load is discharged onto a car or conveyor. { 'skrāp·ər ,lōd·ər }

scraper ring [MECH ENG] A piston ring that scrapes oil from a cylinder wall to prevent it from being burned. { 'skrāp·ər ,riŋ }

scraper trap [ENG] A device for the insertion or recovery of pigs, or scrapers, that are used to clean the inside surfaces of pipelines. { 'skrāp·ər ,trap }

scratch coat [ENG] The first layer of plaster applied to a surface; the surface is scratched to improve the bond with the next coat. { 'skrach ,kōt }

scratch filter [ENG ACOUS] A low-pass filter circuit inserted in the circuit of a phonograph pickup to suppress higher audio frequencies and thereby minimize needle-scratch noise. { 'skrach ,fil·tər }

screed [BUILD] A long, narrow strip of plaster placed at intervals on a surface as a guide for the thickness of plaster to be applied. [CIV ENG] **1.** A straight-edged wood or metal template, fixed temporarily to a surface as a guide when plastering or concreting. **2.** An oscillating metal bar mounted on wheels and spanning a freshly placed road slab, used to strike off and smooth the surface. { skrēd }

screed wire *See* ground wire. { 'skrēd ,wīr }

screen [ELECTR] **1.** The surface on which a television, radar, x-ray, or cathode-ray oscilloscope image is made visible for viewing; it may be a fluorescent screen with a phosphor layer that converts the energy of an electron beam to visible light, or a translucent or opaque screen on which the optical image is projected. Also known as viewing screen. **2.** *See* screen grid. [ENG] **1.** A large sieve of suitably mounted wire cloth, grate bars, or perforated sheet iron used to sort rock, ore, or aggregate according to size. **2.** A covering to give physical protection from light, noise, heat, or flying particles. **3.** A filter medium for liquid-solid separation. { skrēn }

screen analysis [ENG] A method for finding the particle-size distribution of any loose, flowing, conglomerate material by measuring the percentage of particles that pass through a series of standard screens with holes of various sizes. { 'skrēn ə,nal·ə·səs }

screen deck [DES ENG] A surface provided with apertures of specified size, used for screening purposes. { 'skrēn ,dek }

screen dryer *See* traveling-screen dryer. { 'skrēn 'drī·ər }

screening [ENG] **1.** The separation of a mixture of grains of various sizes into two or more size-range portions by means of a porous or woven-mesh screening media. **2.** The removal of solid particles from a liquid-solid mixture by means of a screen. **3.** The material that has passed through a screen. [IND ENG] The elimination of defective pieces from a lot by inspection for specified defects. Also known as detailing. { 'skrēn·iŋ }

screen mesh [ENG] A wire network or cloth mounted in a frame for separating and classifying materials. { 'skrēn ,mesh }

screen overlay *See* glare filter. { ¦skrēn 'ō·vər,lā }

screen pipe [ENG] Perforated pipe with a straining device in the form of closely wound wire coils wrapped around it to admit well fluids while excluding sand. { 'skrēn ,pīp }

screw [DES ENG] **1.** A cylindrical body with a helical groove cut into its surface. **2.** A fastener with continuous ribs on a cylindrical or conical

shank and a slotted, recessed, flat, or rounded head. Also known as screw fastener. { skrü }

screw blank *See* bolt blank. { 'skrü ˌblaŋk }

screw compressor [MECH ENG] A rotary-element gas compressor in which compression is accomplished between two intermeshing, counterrotating screws. { 'skrü kəm'pres·ər }

screw conveyor [MECH ENG] A conveyor consisting of a helical screw that rotates upon a single shaft within a stationary trough or casing, and which can move bulk material along a horizontal, inclined, or vertical plane. Also known as auger conveyor; spiral conveyor; worm conveyor. { 'skrü kən'vā·ər }

screw displacement [MECH] A rotation of a rigid body about an axis accompanied by a translation of the body along the same axis. { 'skrü diˌsplās·mənt }

screw dowel [DES ENG] A metal dowel pin having a straight or tapered thread at one end. { 'skrü ˌdäül }

screwdriver [DES ENG] A tool for turning and driving screws in place; a thin, wedge-shaped or fluted end enters the slot or recess in the head of the screw. { 'skrüˌdrīv·ər }

screw elevator [MECH ENG] A type of screw conveyor for vertical delivery of pulverized materials. { 'skrü 'el·əˌvād·ər }

screw fastener *See* screw. { 'skrü ˌfas·nər }

screwfeed [MECH ENG] A system or combination of gears, ratchets, and friction devices in the swivel head of a diamond drill, which controls the rate at which a bit penetrates a rock formation. { 'skrüˌfēd }

screw feeder [MECH ENG] A mechanism for handling bulk (pulverized or granulated solids) materials, in which a rotating helicoid screw moves the material forward, toward and into a process unit. { 'skrü 'fēd·ər }

screw jack *See* jackscrew. { 'skrü ˌjak }

screw machine [MECH ENG] A lathe for making relatively small, turned metal parts in large quantities. { 'skrü məˌshēn }

screw pile [CIV ENG] A pile having a wide helical blade at the foot which is twisted into position, for use in soft ground or other location requiring a large supporting surface. { 'skrü ˌpīl }

screw plasticating injection molding [ENG] A plastic-molding technique in which plastic is converted from pellets to a viscous (plasticated) melt by an extruder screw that is an integral part of the molding machine. { 'skrü 'plas·tiˌkād·iŋ inˈjek·shən ˌmōld·iŋ }

screw press [MECH ENG] A press having the slide operated by a screw mechanism. { 'skrü ˌpres }

screw propeller [MECH ENG] A marine and airplane propeller consisting of a streamlined hub attached outboard to a rotating engine shaft on which are mounted two to six blades; the blades form helicoidal surfaces in such a way as to advance along the axis about which they revolve. { 'skrü prəˌpel·ər }

screw pump [MECH ENG] A pump that raises water by means of helical impellers in the pump casing. { 'skrü ˌpəmp }

screw rivet [DES ENG] A short rod threaded along the length of the shaft that is set without access to the point. { 'skrü ˌriv·ət }

screw spike [DES ENG] A large nail with a helical thread on the upper portion of the shank; used to fasten railroad rails to the ties. { 'skrü ˌspīk }

screwstock [MECH ENG] Free-machining bar, rod, or wire. { 'skrüˌstäk }

screw thread [DES ENG] A helical ridge formed on a cylindrical core, as on fasteners and pipes. { 'skrü ˌthred }

screw-thread gage [DES ENG] Any of several devices for determining the pitch, major, and minor diameters, and the lead, straightness, and thread angles of a screw thread. { 'skrü ˌthred ˌgāj }

screw-thread micrometer [DES ENG] A micrometer used to measure pitch diameter of a screw thread. { 'skrü ˌthred mī'kräm·əd·ər }

scriber [DES ENG] A sharp-pointed tool used for drawing lines on metal workpieces. { 'skrī·bər }

scroll gear [DES ENG] A variable gear resembling a scroll with teeth on one face. { 'skrōl ˌgir }

scroll saw [ENG] A saw with a narrow blade, used for cutting curves or irregular designs. { 'skrōl ˌsȯ }

scrubber [ENG] A device for the removal, or washing out, of entrained liquid droplets or dust, or for the removal of an undesired gas component from process gas streams. Also known as washer; wet collector. { 'skrəb·ər }

scrub plane [DES ENG] A narrow carpenter's plane with a blade that has a rough surface and a rounded cutting edge. { 'skrəb ˌplān }

scuba diving [ENG] Any of various diving techniques using self-contained underwater breathing apparatus. { 'skü·bə ˌdīv·iŋ }

scuffing [ENG] The dull mark, sometimes the result of abrasion, on the surface of glazed ceramic or glassware. { 'skəf·iŋ }

scuffle hoe [DES ENG] A hoe having two sharp edges so that it can be pushed and pulled. { 'skəf·əl ˌhō }

scum chamber [CIV ENG] An enclosed compartment in an Imhoff tank, in which gas escapes from the scum which rises to the surface of sludge during sewage digestion. { 'skəm ˌchām·bər }

scutch [DES ENG] A small, picklike tool which has flat cutting edges for trimming bricks. Also known as scotch. { skəch }

scuttle [BUILD] An opening in the ceiling to provide access to the attic or roof. { 'skəd·əl }

scythe [DES ENG] A tool with a long curved blade attached at a more or less right angle to a long handle with grips for both hands; used for cutting grass as well as grain and other crops. { sīth }

sea bank *See* seawall. { 'sē ˌbaŋk }

seadrome [CIV ENG] **1.** A designated area for

landing and takeoff of seaplanes. **2.** A platform at sea for landing and takeoff of land planes. { 'sē,drōm }

sea gate [CIV ENG] A gate which serves to protect a harbor or tidal basin from the sea, such as one of a pair of supplementary gates at the entrance to a tidal basin exposed to the sea. { 'sē ,gāt }

seal [ENG] **1.** Any device or system that creates a nonleaking union between two mechanical or process-system elements; for example, gaskets for pipe connection seals, mechanical seals for rotating members such as pump shafts, and liquid seals to prevent gas entry to or loss from a gas-liquid processing sequence. **2.** A tight, perfect closure or joint. { sēl }

Seale rope [DES ENG] A wire rope with six or eight strands, each having a large wire core covered by nine small wires, which, in turn, are covered by nine large wires. { 'sēl ,rōp }

sea-level datum [ENG] A determination of mean sea level that has been adopted as a standard datum for heights or elevations, based on tidal observations over many years at various tide stations along the coasts. { 'sē ¦lev·əl ,dad·əm }

seal off [ENG] To close off, as a tube or borehole, by using a cement or other sealant to eliminate ingress or egress. { 'sēl 'ȯf }

seam [ENG] **1.** A mechanical or welded joint. **2.** A mark on ceramic or glassware where matching mold parts join. **3.** A line occurring on a molded or laminated piece of plastic material that differs in appearance from the rest of the surface and is caused by a parting of the mold. Also known as mold seam. { sēm }

sea marker [ENG] A patch of color on the ocean surface produced by releasing dye; used, for example, to attract the attention of the crew of a rescue airplane. { 'sē ,märkər }

seaport [CIV ENG] A harbor or town that has facilities for seagoing ships and is active in marine activities. { 'sē,pȯrt }

search [ENG] To explore a region in space with radar. { sərch }

search and rescue [ENG] The use of aircraft, surface craft, submarines, specialized rescue teams and equipment to search for and rescue personnel in distress on land or at sea. { 'sərch ən 'res,kyü }

searching control [ENG] A mechanism that changes the azimuth and elevation settings on a searchlight automatically and constantly, so that its beam is swept back and forth within certain limits. { 'sərch·iŋ kən,trōl }

searching lighting *See* horizontal scanning. { 'sərch·iŋ ,līd·iŋ }

searchlight-control radar [ENG] A ground-based radar used to direct searchlights at aircraft. { 'sərch,līt kən¦trōl ,rā,där }

searchlight-type sonar [ENG] A sonar system in which both transmission and reception are effected by the same narrow beam pattern. { 'sərch,līt ¦tīp 'sō,när }

search radar [ENG] A radar intended primarily to cover a large region of space and to display targets as soon as possible after they enter the region; used for early warning, in connection with ground-controlled approach and interception, and in air-traffic control. { 'sərch ,rā,där }

search unit [ENG] The portion of an ultrasonic testing system which incorporates sending and in some cases receiving transducers to scan the workpiece. { 'sərch ,yü·nət }

seasonal balancing [CHEM ENG] A seasonal adjustment of the front-end boiling range (volatility) of a motor gasoline to control engine starting characteristics by compensating for seasonal temperature changes. { 'sēz·ən·əl 'bal·ənsˑiŋ }

seasoning *See* curing. [ELECTR] Overcoming a temporary unsteadiness of a component that may appear when it is first installed. [ENG] Drying of wood either in the air or in a kiln. { 'sēz·ən·iŋ }

sea surveillance [ENG] The systematic observation of surface and subsurface sea areas by all available and practicable means primarily for the purpose of locating, identifying, and determining the movements of ships, submarines, and other vehicles, friendly and enemy, proceeding on or under the surface of seas and oceans. { 'sē sər,vā·ləns }

seat [MECH ENG] The fixed, pressure-containing portion of a valve which comes into contact with the moving portions of that valve. { sēt }

seating-lock locking fastener [DES ENG] A locking fastener that locks only when firmly seated and is therefore free-running on the bolt. { 'sēd·iŋ ¦läk 'läk·iŋ 'fas·nər }

sea van [IND ENG] Commercial or government-owned (or leased) shipping containers which are moved via ocean transportation; since wheels are not attached, they must be lifted on and off the ship. { 'sē ,van }

seawall [CIV ENG] A concrete, stone, or metal wall or embankment constructed along a shore to reduce wave erosion and encroachment by the sea. Also known as sea bank. { 'sē,wȯl }

seawater thermometer [ENG] A specially designed thermometer to measure the temperature of a sample of seawater; an instrument consisting of a mercury-in-glass thermometer protected by a perforated metal case. { 'sē,wȯd·ər thər'mäm·əd·ər }

Secchi disk [ENG] An opaque white disk used to measure the transparency or clarity of seawater by lowering the disk into the water horizontally and noting the greatest depth at which it can be visually detected. { 'sek·ē ,disk }

secondary air [MECH ENG] Combustion air introduced over the burner flame to enhance completeness of combustion. { 'sek·ən,der·ē 'er }

secondary creep [MECH] The change in shape of a substance under a minimum and almost constant differential stress, with the strain-time relationship a constant. Also known as steady-state creep. { 'sek·ən,der·ē 'krēp }

secondary crusher [MECH ENG] Any of a group of crushing and pulverizing machines used after

the primary treatment to further reduce the particle size of shale or other rock. { 'sek·ən,der·ē 'krəsh·ər }

secondary grinding [MECH ENG] A further grinding of material previously reduced to sand size. { 'sek·ən,der·ē 'grīnd·iŋ }

secondary ion mass analyzer [ENG] A type of secondary ion mass spectrometer that provides general surface analysis and depth-profiling capabilities. { 'sek·ən,der·ē 'ī,än 'mas 'an·ə,līz·ər }

secondary ion mass spectrometer [ENG] An instrument for microscopic chemical analysis, in which a beam of primary ions with an energy in the range 5–20 kiloelectronvolts bombards a small spot on the surface of a sample, and positive and negative secondary ions sputtered from the surface are analyzed in a mass spectrometer. Abbreviated SIMS. Also known as ion microprobe; ion probe. { 'sek·ən,der·ē 'ī,än 'mas spek'tram·əd·ər }

secondary port [CIV ENG] A port with one or more berths, normally at quays, which can accommodate oceangoing ships for discharge. { 'sek·ən,der·ē 'pȯrt }

secondary rescue facilities [ENG] Local air-base-ready aircraft, crash boats, and other air, surface, subsurface, and ground elements suitable for rescue missions, including government and privately operated units and facilities. { 'sek·ən,der·ē 'res,kyü fə,sil·əd·ēz }

secondary sewage sludge [CIV ENG] Sludge that includes activated sludge, mixed sludge, and chemically precipitated sludge. { 'sek·ən,der·ē 'sü·ij ,sləj }

secondary stress [MECH] A self-limiting normal or shear stress which is caused by the constraint of a structure and which is expected to cause minor distortions that would not result in a failure of the structure. { 'sek·ən,der·ē 'stres }

secondary tide station [ENG] A place at which tide observations are made over a short period to obtain data for a specific purpose. { 'sek·ən,der·ē 'tīd ,stā·shən }

second breakdown [ELECTR] Destructive breakdown in a transistor, wherein structural imperfections cause localized current concentrations and uncontrollable generation and multiplication of current carriers; reaction occurs so suddenly that the thermal time constant of the collector regions is exceeded, and the transistor is irreversibly damaged. { 'sek·ənd 'brāk,daůn }

second law of motion *See* Newton's second law. { 'sek·ənd 'lȯ əv 'mō·shən }

second law of thermodynamics [THERMO] A general statement of the idea that there is a preferred direction for any process; there are many equivalent statements of the law, the best known being those of Clausius and of Kelvin. { 'sek·ənd 'lȯ əv ,thər·mə·dī'nam·iks }

second-level controller [CONT SYS] A controller which influences the actions of first-level controllers, in a large-scale control system partitioned by plant decomposition, to compensate for subsystem interactions so that overall objectives and constraints of the system are satisfied. Also known as coordinator. { 'sek·ənd ¦lev·əl kən'trōl·ər }

second-order leveling [ENG] Spirit leveling that has less stringent requirements than those of first-order leveling, in which lines between benchmarks established by first-order leveling are run in only one direction. { 'sek·ənd ¦ȯr·dər 'lev·ə·liŋ }

second-order transition [THERMO] A change of state through which the free energy of a substance and its first derivatives are continuous functions of temperature and pressure, or other corresponding variables. { 'sek·ənd ¦ȯr·dər tran'zish·ən }

section [CIV ENG] A piece of land usually 1 mile square (640 acres or approximately 2.58999 square kilometers) with boundaries conforming to meridians and parallels within established limits; 1 of 36 units of subdivision of a township in the U.S. Public Land survey system. { 'sek·shən }

sectional conveyor [MECH ENG] A belt conveyor that can be lengthened or shortened by the addition or the removal of interchangeable sections. { 'sek·shən·əl kən'vā·ər }

sectional core barrel [DES ENG] A core barrel whose length can be increased by coupling unit sections together. { 'sek·shən·əl 'kȯr ,bar·əl }

sectional header boiler [MECH ENG] A horizontal boiler in which tubes are assembled in sections into front and rear headers; the latter, in turn, are connected to the boiler drum by vertical tubes. { 'sek·shən·əl 'hed·ər ¦bȯil·ər }

section house [CIV ENG] A building near a railroad section for housing railroad workers, or for storing maintenance equipment for the section. { 'sek·shən ,haůs }

section line [CIV ENG] A line representing the boundary of a section of land. { 'sek·shən ,līn }

section modulus [MECH] The ratio of the moment of inertia of the cross section of a beam undergoing flexure to the greatest distance of an element of the beam from the neutral axis. { 'sek·shən 'mäj·ə·ləs }

sector [CIV ENG] A clearly defined area or airspace designated for a particular purpose. { 'sek·tər }

sector gate [CIV ENG] A horizontal gate with a pie-slice cross section used to regulate the level of water at the crest of a dam; it is raised and lowered by a rack and pinion mechanism. { 'sek·tər ,gāt }

sector gear [DES ENG] **1.** A toothed device resembling a portion of a gear wheel containing the center bearing and a part of the rim with its teeth. **2.** A gear having such a device as its chief essential feature. [MECH ENG] A gear system employing such a gear as a principal part. { 'sek·tər ,gir }

secular [ENG] Of or pertaining to a long indefinite period of time. { 'sek·yə·lər }

sedimentation tank [ENG] A tank in which suspended matter is removed either by quiescent

settlement or by continuous flow at high velocity and extended retention time to allow deposition. { ˌsed·ə·mənˈtā·shən ˌtaŋk }

sediment bulb [ENG] A bulb for holding sediment that settles from the liquid in a tank. { ˈsed·ə·mənt ˌbəlb }

sediment corer [ENG] A heavy coring tube which punches out a cylindrical sediment section from the ocean bottom. { ˈsed·ə·mənt ˌkȯr·ər }

sediment trap [ENG] A device for measuring the accumulation rate of sediment on the floor of a body of water. { ˈsed·ə·mənt ˌtrap }

Seebeck coefficient [ELECTR] The ratio of the open-circuit voltage to the temperature difference between the hot and cold junctions of a circuit exhibiting the Seebeck effect. { ˈzāˌbek ˌkō·iˈfish·ənt }

Seebeck effect [ELECTR] The development of a voltage due to differences in temperature between two junctions of dissimilar metals in the same circuit. { ˈzāˌbek iˌfekt }

Segas process [CHEM ENG] A process for the production of low-Btu gas by the catalytic method using a fixed bed catalyst, lime-bauxite mixture bonded with bentonite. { ˈsēˌgas ˌprä·səs }

segmental gate *See* tainter gate. { seg'ment·əl 'gāt }

segmental meter [ENG] A variable head meter whose orifice plate has an opening in the shape of a half circle. { seg'ment·əl 'mēd·ər }

segmented aperture-synthetic aperture radar [ENG] An enhancement of synthetic aperture radar that overcomes restrictions on the effective length of the receiving antenna by using a receiving antenna array composed of a set of contiguous subarrays and employing signal processing to provide the proper phase corrections for each subarray. Abbreviated SASAR. { 'seg,ment·əd ¦ap·ə·chər sin'thed·ik ¦ap·ə·chər 'rāˌdär }

segment saw [MECH ENG] A saw consisting of steel segments attached around the edge of a flange and used for cutting veneer. { 'seg·mənt ˌsȯ }

segregation [ENG] **1.** The keeping apart of process streams. **2.** In plastics molding, a close succession of parallel, relatively narrow, and sharply defined wavy lines of color on the surface of a plastic that differ in shade from surrounding areas and create the impression that the components have separated. { ˌseg·rəˈgā·shən }

seine net [ENG] A net used to catch fish by encirclement, usually by closure of the two ends and the bottom. { sān ˌnet }

seismic bracing [ENG] Reinforcement added to a structure to prevent collapse or deformation of building elements as a result of earthquakes. { ¦sīz·mik 'brās·iŋ }

seismic constant [CIV ENG] In building codes dealing with earthquake hazards, an arbitrarily set quantity of steady acceleration, in units of acceleration of gravity, that a building must withstand. { 'sīz·mik 'kän·stənt }

seismic detector [ENG] An instrument that receives seismic impulses. { 'sīz·mik diˌtek·tər }

seismic exploration [ENG] The exploration for economic deposits by using seismic techniques, usually involving explosions, to map subsurface structures. { 'sīz·mik ˌek·splə'rā·shən }

seismic load [ENG] The force on a structure caused by acceleration induced on its mass by an earthquake. { ¦sīz·mik 'lōd }

seismic profiler [ENG] A continuous seismic reflection system used to study the structure beneath the sea floor to depths of 10,000 feet (3000 meters) or more, using a rotating drum to record reflections. { 'sīz·mik 'prōˌfīl·ər }

seismic shooting [ENG] A method of geophysical prospecting in which elastic waves are produced in the earth by the firing of explosives. { 'sīz·mik 'shüd·iŋ }

seismic survey *See* reflection survey. { 'sīz·mik 'sərˌvā }

seismochronograph [ENG] A chronograph for determining the time at which an earthquake shock appears. { ¦sīz·məˈkrän·əˌgraf }

seismogram [ENG] The record made by a seismograph. { 'sīz·məˌgram }

seismograph [ENG] An instrument that records vibrations in the earth, especially earthquakes. { 'sīz·məˌgraf }

seismometer [ENG] An instrument that detects movements in the earth. { sīzˈmäm·əd·ər }

seismoscope [ENG] An instrument for recording only the occurrence or time of occurrence (not the magnitude) of an earthquake. { 'sīz·məˌskōp }

seizing [ENG] Abrasive damage to a metal surface caused when the surface is rubbed by another metal surface. { 'sēz·iŋ }

selected time [IND ENG] An observed actual time value for an element, measured by time study, which is identified as being the most representative of the situation observed. { siˈlek·təd 'tīm }

selective adsorbent [CHEM ENG] Material that will selectively adsorb (or reject) one or more specific components from a multicomponent mixture of gases or liquids; common adsorbents are silica gel, carbon and activated carbon, activated alumina, and synthetic or natural zeolites (molecular sieves). { siˈlek·tiv adˈsȯr·bənt }

selective cracking [CHEM ENG] A refinery process in which recycled stock is distilled in equipment kept separate from that used for distillation of original stock. { siˈlek·tiv 'krak·iŋ }

selectively doped heterojunction transistor *See* high-electron-mobility transistor. { siˈlek·tiv·lē ¦dōpt ¦hed·ə·rōˈ¦jəŋk·shən tranˈzis·tər }

selective polymerization [CHEM ENG] The polymerization of a single type of molecule in a mixture of monomers; for example, the production of diisobutylene from a mixture of butylenes. { siˈlek·tiv pəˌlim·ə·rəˈzā·shən }

selective solubility diffusion [CHEM ENG] The transmission of fluids through a nonporous,

polymeric barrier (membrane) by an adsorption-solution-diffusion-desorption sequence. { si 'lek·tiv ˌsäl·yəˈbil·əd·ē diˌfyü·zhən }

selective solvent [CHEM ENG] A solvent that, at certain temperatures and ratios with other materials, preferentially dissolves more of one component of a liquid or solids mixture than of another, thereby permitting partial separation. { si'lek·tiv 'säl·vənt }

selective transmission [MECH ENG] A gear transmission with a single lever for changing from one gear ratio to another; used in automotive vehicles. { si'lek·tiv tranz·mish·ən }

selectivity diagram [CHEM ENG] A triangular plot of solubilities in a ternary liquid system; used to calculate the ability of a solvent to extract a component from a mixture (its selectivity) at various concentration combinations. { sə ˌlek'tiv·əd·ē 'dī·əˌgram }

selector [CIV ENG] A device that automatically connects the appropriate railroad signal to control the track selected. [ELEC] An automatic or other device for making connections to any one of a number of circuits, such as a selector relay or selector switch. [ENG] **1.** A device for selecting objects or materials according to predetermined properties. **2.** A device for starting or stopping at predetermined positions. [MECH ENG] **1.** The part of the gearshift in an automotive transmission that selects the required gearshift bar. **2.** The lever with which a driver operates an automatic gearshift. { si 'lek·tər }

selenium cell [ELECTR] A photoconductive cell in which a thin film of selenium is used between suitable electrodes; the resistance of the cell decreases when the illumination is increased. { sə'lē·nē·əm ˌsel }

selenium diode [ELECTR] A small area selenium rectifier which has characteristics similar to those of selenium rectifiers used in power systems. { sə'lē·nē·əm 'dīˌōd }

selenium rectifier [ELECTR] A metallic rectifier in which a thin layer of selenium is deposited on one side of an aluminum plate and a conductive metal coating is deposited on the selenium. { sə'lē·nē·əm 'rek·təˌfī·ər }

selenotrope [ENG] A device used in geodetic surveying for reflecting the moon's rays to a distant point, to aid in long-distance observations. { sə'lē·nəˌtrōp }

self-adapting system [SYS ENG] A system which has the ability to modify itself in response to changes in its environment. { ¦self ə¦dap·tiŋ 'sis·təm }

self-centering chuck [MECH ENG] A drill chuck that, when closed, automatically positions the drill rod in the center of the drive rod of a diamond-drill swivel head. { 'self ¦sen·tə·riŋ 'chək }

self-cleaning [ENG] Pertaining to any device that is designed to clean itself without disassembly, for example, a filter in which accumulated filter cake or sludge is removed by an internal scraper or by a blowdown or backwash action. { self 'klēn·iŋ }

self-contained breathing apparatus [ENG] A portable breathing unit which permits freedom of movement. { ¦self kən¦tānd 'breth·iŋ ˌap·əˌrad·əs }

self-contained range finder [ENG] Instrument used for measuring range by direct observation, without using a base line; the two types are the coincidence range finder and the stereoscopic range finder. { ¦self kən¦tānd 'rānj ˌfīn·dər }

self-energizing brake [MECH ENG] A brake designed to reinforce the power applied to it, such as a hand brake. { ¦self ˌen·ərˈ¦īz·iŋ 'brāk }

self-excited vibration *See* self-induced vibration. { ¦self ik'sīd·əd vī'brā·shən }

self-faced stone [CIV ENG] A type of stone used in masonry that splits along natural cleavage planes and does not have to be dressed. { ¦self ˌfāst 'stōn }

self-healing dielectric breakdown [ELECTR] A dielectric breakdown in which the breakdown process itself causes the material to become insulating again. { ¦self ¦hēl·iŋ ˌdī·əˈ¦lek·trik 'brākˌdaůn }

self-induced vibration [MECH] The vibration of a mechanical system resulting from conversion, within the system, of nonoscillatory excitation to oscillatory excitation. Also known as self-excited vibration. { ¦self in¦düst vī'brā·shən }

self-loading [MECH ENG] The capability of a powered industrial truck to pick up, transport, and deposit its load by using components that are part of its standard equipment, for example, a forklift. { 'self ¦lōd·iŋ }

self-locking nut [DES ENG] A nut having an inherent locking action, so that it cannot readily be loosened by vibration. { 'self ¦läk·iŋ 'nət }

self-locking screw [DES ENG] A screw that locks itself in place without requiring a separate nut or lock washer. { 'self ¦läk·iŋ 'skrü }

self-organizing function [CONT SYS] That level in the functional decomposition of a large-scale control system which modifies the modes of control action or the structure of the control system in response to changes in system objectives, contingency events, and so forth. { ¦self ¦ȯr·gəˌnīz·iŋ 'fəŋk·shən }

self-organizing system [SYS ENG] A system that is able to affect or determine its own internal structure. { ¦self ¦ȯr·gəˌnīz·iŋ 'sis·təm }

self-propelled [MECH ENG] Pertaining to a vehicle given motion by means of a self-contained motor. { ¦self prə¦peld }

self-sealing [ENG] A fluid container, such as a fuel tank or a tire, lined with a substance that allows it to close immediately over any small puncture or rupture. { 'self ¦sēl·iŋ }

self-starter [MECH ENG] An attachment for automatically starting an internal combustion engine. { 'self 'stär·dər }

self-tapping screw [DES ENG] A screw with a specially hardened thread that makes it possible for the screw to form its own internal thread in sheet metal and soft materials when driven into

a hole. Also known as sheet-metal screw; tapping screw. { 'self ¦tap·iŋ 'skrü }

self-timer [ENG] A device that delays the tripping of a camera shutter so that the photographer can be included in the photograph. { 'self 'tīm·ər }

self-tuning regulator [CONT SYS] A type of adaptive control system composed of two loops, an inner loop which consists of the process and an ordinary linear feedback regulator, and an outer loop which is composed of a recursive parameter estimator and a design calculation, and which adjusts the parameters of the regulator. Abbreviated STR. { ¦self ¦tün·iŋ 'reg·yə,lād·ər }

sellers hob [MECH ENG] A hob that turns on the centers of a lathe, the work being fed to it by the lathe carriage. { 'sel·ərz 'häb }

Selwood engine [MECH ENG] A revolving-block engine in which two curved pistons opposed 180° run in toroidal tracks, forcing the entire engine block to rotate. { 'sel,wůd ,en·jən }

semiautomatic transmission [MECH ENG] An automobile transmission that assists the driver to shift from one gear to another. { ¦sem·ē,ȯd·ə'mad·ik tranz'mish·ən }

semibatch chemical reactor [CHEM ENG] A reactor in which a constant liquid volume is maintained without any overflow, and with the continuous addition of one reactant, usually a gas. { 'sem·i,bach 'kem·ə·kəl rē'ak·tər }

semichemical pulping [CHEM ENG] A method of producing wood-fiber products in which the wood chips are merely softened by chemical treatment (neutral sodium sulfite solution), while the remainder of the pulping action is supplied by a disk attrition mill or by some similar mechanical device for separating the fibers. { ¦sem·i'kem·ə·kəl 'pəlp·iŋ }

semiclosed-cycle gas turbine [MECH ENG] A heat engine in which a portion of the expanded gas is recirculated. { 'sem·i,klōzd,sī·kəl 'gas ,tər·bən }

semiconductive loading tube [ENG] A loading tube for blasthole explosives which dissipates static electric charges to prevent premature blasts. { ¦sem·i·kən¦dək·tiv 'lōd·iŋ ,tüb }

semiconductor device [ELECTR] Electronic device in which the characteristic distinguishing electronic conduction takes place within a semiconductor. { ¦sem·i·kən¦dək·tər di,vīs }

semiconductor diode [ELECTR] Also known as crystal diode; crystal rectifier; diode. **1.** A two-electrode semiconductor device that utilizes the rectifying properties of a *pn* junction or a point contact. **2.** More generally, any two-terminal electronic device that utilizes the properties of the semiconductor from which it is constructed. { ¦sem·i·kən¦dək·tər 'dī,ōd }

semiconductor-diode parametric amplifier [ELECTR] Parametric amplifier using one or more varactors. { ¦sem·i·kən¦dək·tər ¦dī,ōd ¦par·ə¦me·trik 'am·plə,fī·ər }

semiconductor doping *See* doping. { ¦sem·i·kən¦dək·tər 'dōp·iŋ }

semiconductor heterostructure [ELECTR] A structure of two different semiconductors in junction contact having useful electrical or electrooptical characteristics not achievable in either conductor separately; used in certain types of lasers and solar cells. { ¦sem·i·kən¦dək·tər 'hed·ə·rō,strək·chər }

semiconductor junction [ELECTR] Region of transition between semiconducting regions of different electrical properties, usually between *p*-type and *n*-type material. { ¦sem·i·kən¦dək·tər ,jəŋk·shən }

semiconductor rectifier *See* metallic rectifier. { ¦sem·i·kən¦dək·tər 'rek·tə,fī·ər }

semiconductor thermocouple [ELECTR] A thermocouple made of a semiconductor, which offers the prospect of operation with high-temperature gradients, because semiconductors are good electrical conductors but poor heat conductors. { ¦sem·i·kən¦dək·tər 'thər·mə,kəp·əl }

semidiesel engine [MECH ENG] **1.** An internal combustion engine of a type resembling the diesel engine in using heavy oil as fuel but employing a lower compression pressure and spraying it under pressure, against a hot (uncooled) surface or spot, or igniting it by the precombustion or supercompression of a portion of the charge in a separate member or uncooled portion of the combustion chamber. **2.** A true diesel engine that uses a means other than compressed air for fuel injection. { ¦sem·i'dē·zəl 'en·jən }

semifloating axle [MECH ENG] A supporting member in motor vehicles which carries torque and wheel loads at its outer end. { ¦sem·i'flōd·iŋ 'ak·səl }

semilive skid [ENG] A platform having two fixed legs at one end and two wheels at the other; used for moving bulk materials. { ¦sem·i'līv 'skid }

semimember [CIV ENG] A part in a frame or truss that ceases to bear a load when the stress in it starts to reverse. { ¦sem·i'mem·bər }

semipositive mold [ENG] A plastics mold that allows a small amount of excess material to escape when it is closed. { ¦sem·i'päz·əd·iv 'mōld }

semitrailer [ENG] A cargo-carrying piece of equipment that has one or two axles at the rear; the load is carried on these axles and on the fifth wheel of the tractor that supplies motive power to the semitrailer. { ¦sem·i'trāl·ər }

sems [DES ENG] A preassembled screw and washer combination. { semz }

send *See* scend. { send }

sense [ENG] To determine the arrangement or position of a device or the value of a quantity. { sens }

sensible heat [THERMO] **1.** The heat absorbed or evolved by a substance during a change of temperature that is not accompanied by a change of state. **2.** *See* enthalpy. { 'sen·sə·bəl 'hēt }

sensible-heat factor [THERMO] The ratio of space sensible heat to space total heat; used

for air-conditioning calculations. Abbreviated SHF. { 'sen·sə·bəl ¦hēt ˌfak·tər }

sensible-heat flow [THERMO] The heat given up or absorbed by a body upon being cooled or heated, as the result of the body's ability to hold heat; excludes latent heats of fusion and vaporization. { 'sen·sə·bəl ¦hēt 'flō }

sensing element *See* sensor. { 'sens·iŋ ˌel·ə·mənt }

sensitive altimeter [ENG] An aneroid altimeter constructed to respond to pressure changes (altitude changes) with a high degree of sensitivity; it contains two or more pointers to refer to different scales, calibrated in hundreds of feet, thousands of feet, and so on. { 'sen·səd·iv al'tim·əd·ər }

sensitivity [ELECTR] **1.** The minimum input signal required to produce a specified output signal, for a radio receiver or similar device. **2.** Of a camera tube, the signal current developed per unit incident radiation, that is, per watt per unit area. [ENG] **1.** A measure of the ease with which a substance can be caused to explode. **2.** A measure of the effect of a change in severity of engine-operating conditions on the antiknock performance of a fuel; expressed as the difference between research and motor octane numbers. Also known as spread. { ˌsen·sə'tiv·əd·ē }

sensitivity function [CONT SYS] The ratio of the fractional change in the system response of a feedback-compensated feedback control system to the fractional change in an open-loop parameter, for some specified parameter variation. { ˌsen·sə'tiv·əd·ē ˌfəŋk·shən }

sensitometer [ENG] An instrument for measuring the sensitivity of light-sensitive materials. { ˌsen·sə'täm·əd·ər }

sensor [ENG] The generic name for a device that senses either the absolute value or a change in a physical quantity such as temperature, pressure, flow rate, or pH, or the intensity of light, sound, or radio waves and converts that change into a useful input signal for an information-gathering system; a television camera is therefore a sensor, and a transducer is a special type of sensor. Also known as primary detector; sensing element. { 'sen·sər }

sensory control [CONT SYS] Control of a robot's actions on the basis of its sensor readings. { 'sen·sə·rē kən'trōl }

sensory controlled robot [CONT SYS] A robot whose programmed sequence of instructions can be modified by information about the environment received by the robot's sensors. { 'sen·sə·rē kən'trōld 'rō,bät }

separate sewage system [CIV ENG] A drainage system in which sewage and groundwater are carried in separate sewers. { 'sep·rət 'sü·ij ˌsis·təm }

separating power [CHEM ENG] The measure of the ability of a system (such as a rectifying system) to separate the components of a mixture, when the components have increasingly close boiling points. { 'sep·əˌrād·iŋ ˌpaù·ər }

separation [CHEM ENG] The separation of liquids or gases in a mixture, as by distillation or extraction. [ENG] **1.** The action segregating phases, such as gas-liquid, gas-solid, liquid-solid. **2.** The segregation of solid particles by size range, as in screening. [ENG ACOUS] The degree, expressed in decibels, to which left and right stereo channels are isolated from each other. { ˌsep·ə'rā·shən }

separation theorem [CONT SYS] A theorem in optimal control theory which states that the solution to the linear quadratic Gaussian problem separates into the optimal deterministic controller (that is, the optimal controller for the corresponding problem without noise) in which the state used is obtained as the output of an optimal state estimator. { ˌsep·ə'rā·shən ˌthir·əm }

separator [ELEC] A porous insulating sheet used between the plates of a storage battery. [ELECTR] A circuit that separates one type of signal from another by clipping, differentiating, or integrating action. [ENG] **1.** A machine for separating materials of different specific gravity by means of water or air. **2.** Any machine for separating materials, as the magnetic separator. [MECH ENG] *See* cage. { 'sep·əˌrād·ər }

separator-filter [ENG] A vessel that removes solids and entrained liquid from a liquid or gas stream, using a combination of a baffle or coalescer with a screening (filtering) element. { 'sep·əˌrād·ər 'fil·tər }

sepatrix [CONT SYS] A curve in the phase plane of a control system representing the solution to the equations of motion of the system which would cause the system to move to an unstable point. { 'sep·əˌtriks }

septic tank [CIV ENG] A settling tank in which settled sludge is in immediate contact with sewage flowing through the tank while solids are decomposed by anaerobic bacterial action. { 'sep·tik ˌtaŋk }

sequence [ENG] An orderly progression of items of information or of operations in accordance with some rule. { 'sē·kwəns }

sequencer [ENG] A mechanical or electronic device that may be set to initiate a series of events and to make the events follow in a given sequence. { 'sē·kwən·sər }

sequence robot *See* preprogrammed robot. { 'sē·kwəns ˌrō,bät }

sequence-stressing loss [ENG] In posttensioning, the loss of elasticity in a stressed tendon that results from the shortening of the member as additional tendons are stressed. { 'sē·kwəns ˌstres·iŋ ˌlòs }

sequencing [IND ENG] Designating the order of performance of tasks to assure optimal utilization of available production facilities. { 'sē·kwəns·iŋ }

sequential collation of range [ENG] Spherical, long-baseline, phase-comparison trajectory-measuring system using three or more ground stations, time-sharing a single transponder, to provide nonambiguous range measurements to

determine the instantaneous position of a vehicle in flight. { si'kwen·chəl kə'lā·shən əv 'rānj }

sequential logic element [ELECTR] A circuit element having at least one input channel, at least one output channel, and at least one internal state variable, so designed and constructed that the output signals depend on the past and present states of the inputs. { si'kwen·chəl ¦läj·ik ¸el·ə·mənt }

sequential sampling [IND ENG] A sampling plan in which an undetermined number of samples are tested one by one, accumulating the results until a decision can be made. { si'kwen·chəl 'sam·pliŋ }

serial [IND ENG] An element or a group of elements within a series which is given a numerical or alphabetical designation for convenience in planning, scheduling, and control. { 'sir·ē·əl }

series [ELEC] An arrangement of circuit components end to end to form a single path for current. { 'sir·ēz }

series circuit [ELEC] A circuit in which all parts are connected end to end to provide a single path for current. { 'sir·ēz ¸sər·kət }

series compensation [CONT SYS] *See* cascade compensation. [ELEC] The insertion of variable, controlled, high-voltage series capacitors into transmission lines in order to modify the impedance structure of a transmission network so as to adjust the power-flow distribution on individual lines and thus increase the power flow across such compensated lines. { 'sir·ēz ¸käm·pən'sā·shən }

series connection [ELEC] A connection that forms a series circuit. { 'sir·ēz kə¸nek·shən }

series firing [ENG] The firing of detonators in a round of shots by passing the total supply current through each of the detonators. { 'sir·ēz 'fīr·iŋ }

series-parallel firing [ENG] The firing of detonators in a round of shots by dividing the total supply current into branches, each containing a certain number of detonators wired in series. { 'sir·ēz ¦par·ə¸lel ¦fīr·iŋ }

series production [IND ENG] The manufacture of a product or service by a group of operations sequenced so that all materials will be routed successively through each production state. Also known as batch production. { 'sir·ēz prə'dək·shən }

series reliability [SYS ENG] Property of a system composed of elements in such a way that failure of any one element causes a failure of the system. { 'sir·ēz ri¸lī·ə'bil·əd·ē }

series shots [ENG] The connecting and firing of a number of loaded holes one after the other. { 'sir·ēz ¸shäts }

serpentine cooler *See* cascade cooler. { 'sər·pən¸tēn 'kül·ər }

service [ENG] To perform services of maintenance, supply, repair, installation, distribution, and so on, for or upon an instrument, installation, vehicle, or territory. { 'sər·vəs }

serviceability [IND ENG] The reliability of equipment according to some objective criterion such as serviceability ratio, utilization ratio, or operating ratio. { ¸sər·və·sə'bil·əd·ē }

serviceability ratio [IND ENG] The ratio of up time to the sum of up time and down time. { ¸sər·və·sə'bil·əd·ē ¸rā·shō }

service agreement [ENG] A contract which agrees to provide mechanical maintenance of a machine for a fixed period of time at a stated charge. { 'sər·vəs ə¸grē·mənt }

service brake [MECH ENG] The brake used for ordinary driving in an automotive vehicle; usually foot-operated. { 'sər·vəs ¸brāk }

service dead load [ENG] The calculated dead load that will be supported by a member. { ¦sər·vəs 'ded ¸lōd }

service engineering [ENG] The function of determining the integrity of material and services in order to measure and maintain operational reliability, approve design changes, and assure their conformance with established specifications and standards. { 'sər·vəs ¸en·jə¸nir·iŋ }

service factor [ENG] For a chemical or a petroleum processing plant or its equipment, the measure of the continuity of an operation, computed by dividing the time on-stream (actual running time) by the total elapsed time. { 'sər·vəs ¸fak·tər }

service life [ENG] The length of time during which a machine, tool, or other apparatus or device can be operated or used economically or before breakdown. { 'sər·vəs ¸līf }

service pipe [CIV ENG] A pipe linking a building to a main pipe. { 'sər·vəs ¸pīp }

service road [CIV ENG] A small road parallel to the main road for convenient access to shops and houses. { 'sər·vəs ¸rōd }

service time *See* machine attention time. { 'sər·vəs ¸tīm }

service valve [ENG] In a pipework system, a valve that isolates a piece of equipment from the rest of the system. { 'sər·vəs ¸valv }

service wires [ELEC] The conductors that bring the electric power into a building. { 'sər·vəs ¸wīrz }

servicing [ENG] Replacement of consumable material or items needed to keep equipment in operating condition; does not include preventive or corrective maintenance. { 'sər·vəs·iŋ }

servo *See* servomotor. { 'sər·vō }

servoarm attachment [MECH ENG] A device that enhances the maximum distance over which the manipulator of a simple robot can travel. { 'sər·vō¸ärm ə¸tach·mənt }

servo brake [MECH ENG] **1.** A brake in which the motion of the vehicle is used to increase the pressure on one of the shoes. **2.** A brake in which the force applied by the operator is augmented by a power-driven mechanism. { 'sər·vō 'brāk }

servolink [CONT SYS] A power amplifier, usually mechanical, by which signals at a low power level are made to operate control surfaces requiring relatively large power inputs, for example, a relay and motor-driven actuator. { 'sər·vō¸liŋk }

servo loop *See* single-loop servomechanism. { 'sər·vō ˌlüp }

servomechanism [CONT SYS] An automatic feedback control system for mechanical motion; it applies only to those systems in which the controlled quantity or output is mechanical position or one of its derivatives (velocity, acceleration, and so on). Also known as servo system. { ¦sər·vō'mek·əˌniz·əm }

servomotor [CONT SYS] The electric, hydraulic, or other type of motor that serves as the final control element in a servomechanism; it receives power from the amplifier element and drives the load with a linear or rotary motion. Also known as servo. { 'sər·vōˌmōd·ər }

servonoise [ENG] Hunting action of the tracking servomechanism of a radar, which results from backlash and compliance in the gears, shafts, and structures of the mount. { 'sər·vōˌnȯiz }

servo system *See* servomechanism. { 'sər·vō ˌsis·təm }

servovalve [MECH ENG] A transducer in which a low-energy signal controls a high-energy fluid flow so that the flow is proportional to the signal. { 'sər·vōˌvalv }

set [ELECTR] The placement of a storage device in a prescribed state, for example, a binary storage cell in the high or 1 state. [ENG] **1.** A combination of units, assemblies, and parts connected or otherwise used together to perform an operational function, such as a radar set. **2.** In plastics processing, the conversion of a liquid resin or adhesive into a solid state by curing or evaporation of solvent or suspending medium, or by gelling. **3.** Saw teeth bent out of the plane of the saw body, resulting in a wide cut in the workpiece. [MECH] *See* permanent set. { set }

setback [BUILD] **1.** A withdrawal of the face of a building to a line toward the rear of the building line or the rear of the wall below in order to reduce obstruction of sunlight reaching the street or the lower stories of adjacent buildings. **2.** *See* offset. [CIV ENG] The distance that a section of a building is set back from the property line as required by local zoning codes. [MECH] The relative rearward movement of component parts in a projectile, missile, or fuse undergoing forward acceleration during its launching; these movements, and the setback force which causes them, are used to promote events which participate in the arming and eventual functioning of the fuse. { 'setˌbak }

setback force [MECH] The rearward force of inertia which is created by the forward acceleration of a projectile or missile during its launching phase; the forces are directly proportional to the acceleration and mass of the parts being accelerated. { 'setˌbak ˌfȯrs }

set bit [DES ENG] A bit insert with diamonds or other cutting media. { 'set ˌbit }

set casing [ENG] Introducing cement between the casing and the wall of the hole to seal off intermediate formations and prevent fluids from entering the hole. { 'set ˌkās·iŋ }

set forward [MECH] Relative forward movement of component parts which occurs in a projectile, missile, or bomb in flight when impact occurs; the effect is due to inertia and is opposite in direction to setback. { 'set 'fȯr·wərd }

set forward force [MECH] The forward force of inertia which is created by the deceleration of a projectile, missile, or bomb when impact occurs; the forces are directly proportional to the deceleration and mass of the parts being decelerated. Also known as impact force. { 'set 'fȯr·wərd ˌfȯrs }

set forward point [MECH] A point on the expected course of the target at which it is predicted the target will arrive at the end of the time of flight. { 'set 'fȯr·wərd ˌpȯint }

set hammer [DES ENG] **1.** A hammer used as a shaping tool by blacksmiths. **2.** A hollow-face tool used in setting rivets. { 'set ˌham·ər }

setover [ENG] A device which helps move a lathe tailstock or headstock on its base so that a taper on a turned piece can be obtained. { 'setˌō·vər }

set point [CONT SYS] The value selected to be maintained by an automatic controller. { 'set ˌpȯint }

set pressure [MECH ENG] The inlet pressure at which a relief valve begins to open as required by the code or standard applicable to the pressure vessel to be protected. { 'set ˌpresh·ər }

set screw [DES ENG] A small headless machine screw, usually having a point at one end and a recessed hexagonal socket or a slot at the other end, used for such purposes as holding a knob or gear on a shaft. { 'set ˌskrü }

setting angle [MECH ENG] The angle, usually 90°, between the straight portion of the tool shank of the machined portion of the work. { 'sed·iŋ ˌaŋ·gəl }

setting circle [ENG] A coordinate scale on an optical pointing instrument, such as a telescope or surveyor's transit. { 'sed·iŋ ˌsər·kəl }

setting gage [ENG] A standard gage for testing a limit gage or setting an adjustable limit gage. { 'sed·iŋ ˌgāj }

setting temperature [ENG] The temperature at which a liquid resin or adhesive, or an assembly involving them, will set, that is, harden, gel, or cure. { 'sed·iŋ ˌtem·prə·chər }

setting time [ENG] The length of time that a resin or adhesive must be subjected to heat or pressure to cause them to set, that is, harden, gel, or cure. { 'sed·iŋ ˌtīm }

settleable solids test [CIV ENG] A test used in examination of sewage to help determine the sludge-producing characteristics of sewage; a measurement of the part of the suspended solids heavy enough to settle is made in an Imhoff cone. { 'sed·əl·ə·bəl 'säl·ədz ˌtest }

settlement [CIV ENG] The gradual downward movement of an engineering structure, due to compression of the soil below the foundation. { 'sed·əl·mənt }

settler [ENG] A separator, such as a tub, pan, vat, or tank in which the partial separation of a mixture is made by density difference; used to separate solids from liquid or gas, immiscible liquid from liquid, or liquid from gas. { 'set·lər }

settling [ENG] The gravity separation of heavy from light materials; for example, the settling out of dense solids or heavy liquid droplets from a liquid carrier, or the settling out of heavy solid grains from a mixture of solid grains of different densities. { 'set·liŋ }

settling basin [CIV ENG] An artificial trap designed to collect suspended stream sediment before discharge of the stream into a reservoir. [IND ENG] A sedimentation area designed to remove pollutants from factory effluents. { 'set·liŋ ˌbās·ən }

settling chamber [ENG] A vessel in which solids or heavy liquid droplets settle out of a liquid carrier by gravity during processing or storage. { 'set·liŋ ˌchām·bər }

settling reservoir [CIV ENG] A reservoir consisting of a series of basins connected in steps by long weirs; only the clear top layer of each basin is drawn off. { 'set·liŋ ˌrez·əvˌwär }

settling tank [ENG] A tank into which a two-phase mixture is fed and the entrained solids settle by gravity during storage. { 'set·liŋ ˌtaŋk }

settling time *See* correction time. { 'set·liŋ ˌtīm }

settling velocity [MECH] The velocity reached by a particle as it falls through a fluid, dependent on its size and shape, and the difference between its specific gravity and that of the settling medium; used to sort particles by grain size. { 'set·liŋ vəˌläs·əd·ē }

setup [ELECTR] The ratio between the reference black level and the reference white level in television, both measured from the blanking level; usually expressed as a percentage. [IND ENG] The preparation of a facility or a machine for a specific work method, activity, or process. { 'sedˌəp }

setup person [CONT SYS] A person who uses a teach pendant to instruct a robot in its motions. { 'sedˌəp ˌpər·sən }

setup time [CONT SYS] The total time needed to prepare a robot to carry out a task, including the time required to obtain the proper tools or end effectors and any work pieces. [IND ENG] In manufacturing operations, the time needed to perform tasks involved in starting up an operation. Also known as start-up time. { 'sedˌəp ˌtīm }

severity factor [CHEM ENG] A measure of the severeness or intensity of overall reaction conditions in a chemical reaction; for example, the temperature, pressure, or conversion in a catalytic cracker or reformer. { si'ver·əd·ē ˌfak·tər }

sewage [CIV ENG] The fluid discharge from medical, domestic, and industrial sanitary appliances. Also known as sewerage. { 'sü·ij }

sewage disposal plant [CIV ENG] The land, building, and apparatus employed in the treatment of sewage by chemical precipitation or filtration, bacterial action, or some other method. { 'sü·ij di¦spōz·əl ˌplant }

sewage sludge [CIV ENG] A semiliquid waste with a solid concentration in excess of 2500 parts per million, obtained from the purification of municipal sewage. Also known as sludge. { 'sü·ij ˌsləj }

sewage system [CIV ENG] A drainage system for carrying surface water and sewage for disposal. { 'sü·ij ˌsis·təm }

sewage treatment [CIV ENG] A process for the purification of mixtures of human and other domestic wastes; the process can be aerobic or anaerobic. { 'sü·ij ˌtrēt·mənt }

sewer [CIV ENG] An underground pipe or open channel in a sewage system for carrying water or sewage to a disposal area. { 'sü·ər }

sewerage *See* sewage. { 'sü·ə·rij }

sewing machine [MECH ENG] A mechanism that stitches cloth, leather, book pages, or other material by means of a double-pointed or eye-pointed needle. { 'sō·iŋ məˌshēn }

SFC *See* specific fuel consumption.

shackle [DES ENG] An open or closed link of various shapes with extended legs; each leg has a transverse hole to accommodate a pin, bolt, or the like, which may or may not be furnished. { 'shak·əl }

shackle bolt [DES ENG] A cylindrically shaped metal bar for connecting the ends of a shackle. { 'shak·əl ˌbōlt }

shading coefficient [ENG] A ratio of the solar energy transmitted through a window to the incident solar energy; used to express the effectiveness of a shading device. { 'shād·iŋ ˌkō·iˌfish·ənt }

shading ring [ENG ACOUS] A heavy copper ring sometimes placed around the central pole of an electrodynamic loudspeaker to serve as a shorted turn that suppresses the hum voltage produced by the field coil. { 'shād·iŋ ˌriŋ }

shadow photometer [ENG] A simple photometer in which a rod is placed in front of a screen and two light sources to be compared are adjusted in position until their shadows touch and are equal in intensity. { 'shad·ō fō'täm·əd·ər }

shaft [MECH ENG] A cylindrical piece of metal used to carry rotating machine parts, such as pulleys and gears, to transmit power or motion. { shaft }

shaft balancing [DES ENG] The process of redistributing the mass attached to a rotating body in order to reduce vibrations arising from centrifugal force. Also known as rotor balancing. { 'shaft ˌbal·ənsˌiŋ }

shaft furnace [ENG] A vertical, refractory-lined cylinder in which a fixed bed (or descending column) of solids is maintained, and through which an ascending stream of hot gas is forced; for example, the pig-iron blast furnace and the phosphors-from-phosphate-rock furnace. { 'shaft ¦fər·nəs }

shaft hopper [MECH ENG] A hopper that feeds

shafts or tubes to grinders, threaders, screw machines, and tube benders. { 'shaft ˌhäp·ər }

shaft horsepower [MECH ENG] The output power of an engine, motor, or other prime mover; or the input power to a compressor or pump. { 'shaft 'hȯrsˌpau̇·ər }

shafting [MECH ENG] The cylindrical machine element used to transmit rotary motion and power from a driver to a driven element; for example, a steam turbine driving a ship's propeller. { 'shaft·iŋ }

shaft kiln [ENG] A kiln in which raw material fed into the top, moves down through hot gases flowing up from burners on either side at the bottom, and emerges as a product from the bottom; used for calcining operations. { 'shaft ˌkil }

shaft spillway [CIV ENG] A vertical shaft which has a funnel-shaped mouth and ends in an outlet tunnel, providing an overflow duct for a reservoir. Also known as morning glory spillway. { 'shaft 'spilˌwā }

shakedown test [ENG] An equipment test made during the installation work. { 'shāk ˌdau̇n ˌtest }

shake table *See* vibration machine. { 'shāk ˌtā·bəl }

shake-table test [ENG] A laboratory test for vibration tolerance, in which the device to be tested is placed on a shake table. { 'shāk ˌtā·bəl ˌtest }

shaking-out [CHEM ENG] A procedure in which a sample of crude oil is centrifuged at high speed to separate its components; used to determine sediment and water content. { 'shāk·iŋ ˌau̇t }

shaking screen [MECH ENG] A screen used in separating material into desired sizes; has an eccentric drive or an unbalanced rotating weight to produce shaking. { 'shāk·iŋ ˌskrēn }

shank [DES ENG] **1.** The end of a tool which fits into a drawing holder, as on a drill. **2.** *See* bit blank. { shaŋk }

shank-type cutter [DES ENG] A cutter having a shank to fit into the machine tool spindle or adapter. { 'shaŋk ˌtīp ˌkəd·ər }

shape coding [DES ENG] The use of special shapes for control knobs, to permit recognition and sometimes also position monitoring by sense of touch. { 'shāp ˌkōd·iŋ }

shaped-chamber manometer [ENG] A flow measurement device that measures differential pressure with a uniform flow-rate scale with a specially shaped chamber. { 'shāpt ˌchām·bər mə'näm·əd·ər }

shape factor [ELEC] *See* form factor. [ELECTR] The ratio of the 60-decibel bandwidth of a bandpass filter to the 3-decibel bandwidth. { 'shāp ˌfak·tər }

shaper [MECH ENG] A machine tool for cutting flat-on-flat, contoured surfaces by reciprocating a single-point tool across the workpiece. { 'shā·pər }

shaping circuit *See* corrective network. { 'shāp·iŋ ˌsər·kət }

shaping dies [MECH ENG] A set of dies for bending, pressing, or otherwise shaping a material to a desired form. { 'shāp·iŋ ˌdīz }

shapometer [ENG] A device used to measure the shape of sedimentary particles. { shā'päm·əd·ər }

sharp-crested weir [CIV ENG] A weir in which the water flows over a thin, sharp edge. { 'shärp ˌkres·təd 'wer }

sharpen [ENG] To give a thin keen edge or a sharp acute point to. { 'shär·pən }

sharpening stone [ENG] Adevice such as a whetstone used for sharpening by hand. { 'shär·pə·niŋ ˌstōn }

sharp iron [ENG] A tool used to open seams for caulking. { 'shärp 'ī·ərn }

sharp V thread [DES ENG] A screw thread having a sharp crest and root; the included angle is usually 60°. { 'shärp 'vē ˌthred }

shattering [MECH] The breaking up into highly irregular, angular blocks of a very hard material that has been subjected to severe stresses. { 'shad·ə·riŋ }

shave hook [DES ENG] A plumber's or metalworker's tool composed of a sharp-edged steel plate on a shank; used for scraping metal. { 'shāv ˌhu̇k }

shaving [ENG ACOUS] Removing material from the surface of a disk recording medium to obtain a new recording surface. [MECH ENG] **1.** Cutting off a thin layer from the surface of a workpiece. **2.** Trimming uneven edges from stampings, forgings, and tubing. { 'shāv·iŋ }

shear [DES ENG] A cutting tool having two opposing blades between which a material is cut. [ENG] An apparatus for hoisting heavy loads consisting of two or more poles fastened together at their upper ends and spread apart at their lower ends, secured or steadied by a guy or guys, and provided with a tackle. Also known as shear legs. [MECH] *See* shear strain. { shir }

shear angle [MECH ENG] The angle made by the shear plane with the work surface. { 'shir ˌaŋ·gəl }

shear cell [ENG] The component for holding the powder in an apparatus for making measurements of the failure properties of a sample of powder. { 'shir ˌsel }

shear center *See* center of twist. { 'shir ˌsen·tər }

shear diagram [MECH] A diagram in which the shear at every point along a beam is plotted as an ordinate. { 'shir ˌdī·əˌgram }

shear fracture [MECH] A fracture resulting from shear stress. { 'shir ˌfrak·chər }

shearing [MECH ENG] Separation of material by the cutting action of shears. { 'shir·iŋ }

shearing die [MECH ENG] A die with a punch for shearing the work from the stock. { 'shir·iŋ ˌdī }

shearing forces [MECH] Two forces that are equal in magnitude, opposite in direction, and act along two distinct parallel lines. { 'shēr·iŋ ˌfȯrs·əz }

shearing machine [MECH ENG] A machine for

cutting cloth or bars, sheets, or plates of metal or other material. { 'shir·iŋ mə,shēn }

shearing punch [MECH ENG] A punch that cuts material by shearing it, with minimal crushing effect. { 'shir·iŋ ˌpənch }

shearing strain [MECH] The distortion that results from motion of material on opposite sides of a plane in opposite directions parallel to the plane. { 'shir·iŋ ˌstrān }

shearing stress [MECH] A stress in which the material on one side of a surface pushes on the material on the other side of the surface with a force which is parallel to the surface. Also known as shear stress; tangential stress. { 'shir·iŋ ˌstres }

shearing tool [DES ENG] A cutting tool (for a lathe, for example) with a considerable angle between its face and a line perpendicular to the surface being cut. { 'shir·iŋ ˌtül }

shear legs *See* shear. { 'shir ˌlegz }

shear mark [ENG] A crease on a piece of pressed glass; results when the piece is sheared off for pressing. { 'shir ˌmärk }

shear modulus *See* modulus of elasticity in shear. { 'shir ˌmäj·ə·ləs }

shear pin [DES ENG] **1.** A pin or wire provided in a fuse design to hold parts in a fixed relationship until forces are exerted on one or more of the parts which cause shearing of the pin or wire; the shearing is usually accomplished by setback or set forward (impact) forces; the shear member may be augmented during transportation by an additional safety device. **2.** In a propellant-actuated device, a locking member which is released by shearing. **3.** In a power train, such as a winch, any pin, as through a gear and shaft, which is designed to fail at a predetermined force in order to protect a mechanism. { 'shir ˌpin }

shear plane [MECH] A confined zone along which fracture occurs in metal cutting. { 'shir ˌplān }

shear spinning [MECH ENG] A sheet-metal-forming process which forms parts with rotational symmetry over a mandrel with the use of a tool or roller in which deformation is carried out with a roller in such a manner that the diameter of the original blank does not change but the thickness of the part decreases by an amount dependent on the mandrel angle. { 'shir ˌspin·iŋ }

shear strain [MECH] Also known as shear. **1.** A deformation of a solid body in which a plane in the body is displaced parallel to itself relative to parallel planes in the body; quantitatively, it is the displacement of any plane relative to a second plane, divided by the perpendicular distance between planes. **2.** The force causing such deformation. { 'shir ˌstrān }

shear strength [MECH] **1.** The maximum shear stress which a material can withstand without rupture. **2.** The ability of a material to withstand shear stress. { 'shir ˌstreŋkth }

shear stress *See* shearing stress. { 'shir ˌstres }

shear test [ENG] Any of various tests to determine shear strength of soil samples. { 'shir ˌtest }

shear wave [MECH] A wave that causes an element of an elastic medium to change its shape without changing its volume. Also known as rotational wave. { 'shir ˌwāv }

sheath [ELEC] A protective outside covering on a cable. [ELECTR] A space charge formed by ions near an electrode in a gas tube. { shēth }

sheathed explosive [ENG] A permitted explosive enveloped by a sheath containing a noncombustible powder which reduces the temperature of the resultant gases of the explosion and, therefore, reduces the risk of these hot gases causing a firedamp ignition. { 'shēthd ik'splō·siv }

sheave [DES ENG] A grooved wheel or pulley. { shēv }

sheepsfoot roller [DES ENG] A cylindrical steel drum to which knob-headed spikes are fastened; used for compacting earth. Also known as tamping roller. { 'shēps,fůt ˌrōl·ər }

sheepskin wheel [DES ENG] A polishing wheel made of sheepskin disks or wedges either quilted or glued together. { 'shēp,skin ˌwēl }

sheet forming [ENG] The process of producing thin, flat sections of solid materials; for example, sheet metal, sheet plastic, or sheet glass. { 'shēt ˌfȯrm·iŋ }

sheet-metal screw *See* self-tapping screw. { 'shēt ¦med·əl ˌskrü }

sheet piling [CIV ENG] Closely spaced piles of wood, steel, or concrete driven vertically into the ground to obstruct lateral movement of earth or water, and often to form an integral part of the permanent structure. { 'shēt ˌpīl·iŋ }

sheet train [ENG] The entire assembly needed to produce plastic sheet; includes the extruder, die, polish rolls, conveyor, draw rolls, cutter, and stacker. { 'shēt ˌtrān }

Shelby tube [ENG] A thin-shelled tube used to take deep-soil samples; the tube is pushed into the undisturbed soil at the bottom of the casting of the borehole driven into the ground. { 'shel·bē ˌtüb }

shelf angle [CIV ENG] A mild steel angle section, riveted or welded to the web of an I beam to support the formwork for hollow tiles or the floor or roof units, or to form a seat for precast concrete. { 'shelf ˌaŋ·gəl }

shelf life [ENG] The time that elapses before stored food, chemicals, batteries, and other materials or devices become inoperative or unusable due to age or deterioration. { 'shelf ˌlīf }

shell [BUILD] A building without internal partitions or furnishings. [DES ENG] **1.** The case of a pulley block. **2.** A thin hollow cylinder. **3.** A hollow hemispherical structure. **4.** The outer wall of a vessel or tank. { shel }

shellac wheel [DES ENG] A grinding wheel having the abrasive bonded with shellac. { shə 'lak ˌwēl }

shell-and-tube exchanger [ENG] A device for the transfer of heat from a hot fluid to a cooler

fluid; one fluid passes through a group (bundle) of tubes, the other passes around the tubes, through a surrounding shell. Also known as tubular exchanger. { ¦shel ən ¦tüb iks'chān·jər }

shell capacity [ENG] The amount of liquid that a tank car or tank truck will hold when the liquid just touches the underside of the top of the tank shell. { 'shel kə¸pas·əd·ē }

shell clearance [DES ENG] The difference between the outside diameter of a bit or core barrel and the outside set or gage diameter of a reaming shell. { 'shel ¸klir·əns }

shell innage [ENG] The depth of a liquid in a tank car or tank truck shell. { 'shel ¸in·ij }

shell knocker [ENG] A device to strike the external surface of a horizontally rotating process vessel (for example, a kiln or a dryer) to loosen accumulations of solid materials from the inner walls or flights of the shell. Also known as knocker. { 'shel ¸näk·ər }

shell outage [ENG] The unfilled portion of a tank car or tank truck shell; the distance from the underside of the top of the shell to the level of the liquid in the shell. { 'shel ¸aůd·ij }

shell pump [MECH ENG] A simple pump for removing wet sand or mud; consists of a hollow cylinder with a ball or clack valve at the bottom. { 'shel ¸pəmp }

shell reamer [DES ENG] A machine reamer consisting of two parts, the arbor and the replaceable reamer, with straight or spiral flutes; designed as a sizing or finishing reamer. { 'shel ¸rēm·ər }

shell roof [BUILD] A roof made of a thin, curved, platelike structure, usually of concrete but lumber and steel are also used. { 'shel ¸rüf }

shell still [CHEM ENG] A distillation device formerly used in petroleum refineries; oil was charged into a closed, cylindrical shell and heat was applied to the outside of the bottom by a firebox. { 'shel ¸stil }

Shenstone effect [ELECTR] An increase in photoelectric emission of certain metals following passage of an electric current. { 'shen¸stōn i¸fekt }

SHF *See* sensible-heat factor.

shield [ENG] An iron, steel, or wood framework used to support the ground ahead of the lining in tunneling and mining. { shēld }

shielded wire [ELEC] Insulated wire covered with a metal shield, usually of tinned braided copper wire. { 'shēl·dəd 'wīr }

shift [IND ENG] The number of hours or the part of any day worked. Also known as tour. [MECH ENG] To change the ratio of the driving to the driven gears to obtain the desired rotational speed or to avoid overloading and stalling an engine or a motor. { shift }

shift joint [BUILD] A vertical joint placed on a solid member of the course below. { 'shift ¸jȯint }

shift work [IND ENG] Work paid for by day wage. { 'shift ¸wərk }

shim [ENG] **1.** In the manufacture of plywood, a long, narrow patch glued into the panel or cemented into the lumber core itself. **2.** A thin piece of material placed between two surfaces to obtain a proper fit, adjustment, or alignment. { shim }

shimmy [MECH] Excessive vibration of the front wheels of a wheeled vehicle causing a jerking motion of the steering wheel. { 'shim·ē }

shingle lap [DES ENG] A lap joint in which the two surfaces are tapered, with the thinner surface lapped over the thicker one. { 'shiŋ·gəl ¸lap }

shingle nail [DES ENG] A nail about a half to a full gage thicker than a common nail of the same length. { 'shiŋ·gəl ¸nāl }

ship auger [DES ENG] An auger consisting of a spiral body having a single cutting edge, with or without a screw; there is no spur at the outer end of the cutting edge. { 'ship ¸ȯg·ər }

shipbuilding [CIV ENG] The construction of ships. { 'ship¸bil·diŋ }

shipfitter [CIV ENG] A worker who builds the steel structure of a ship, including laying-off and fabricating the individual members, subassembly, and erection on the shipway. { 'ship¸fid·ər }

ship motion [ENG] Translational and rotational motions of a ship in a wave system which cause the center of gravity to deviate from simple straight-line motion; these motions are heave, surge, sway, roll, pitch, and yaw. { 'ship ¸mō·shən }

shipping and storage container [IND ENG] A reusable noncollapsible container of any configuration designed to provide protection for a specific item against impact, vibration, climatic conditions, and the like, during handling, shipment, and storage. { 'ship·iŋ ən 'stȯr·ij kən¸tā·nər }

shipping document [IND ENG] A document listing the items in a shipment, and showing other supply and transportation information that is required by agencies concerned in the movement of material. { 'ship·iŋ ¸däk·yə·mənt }

shipping time [ENG] The time elapsing between the shipment of material by the supplying activity and receipt of material by the requiring activity. { 'ship·iŋ ¸tīm }

shipping ton *See* ton. { 'ship·iŋ ¸tən }

shipway [CIV ENG] **1.** The ways on which a ship is constructed. **2.** The supports placed underneath a ship in dry dock. { 'ship¸wā }

shipwright [CIV ENG] A worker whose responsibility is to ensure that the structure of a ship is straight and true and to the designed dimensions; the work starts with the laying down of the keel blocks and continues throughout the steelwork; applicable also to wood ship builders. { 'ship¸rīt }

shipyard [CIV ENG] A facility adjacent to deep water where ships are constructed or repaired. { 'ship¸yärd }

SHM *See* harmonic motion.

shock [MECH] A pulse or transient motion or force lasting thousandths to tenths of a second which is capable of exciting mechanical resonances; for example, a blast produced by explosives. { 'shäk }

shock absorber [MECH ENG] A spring, a dashpot, or a combination of the two, arranged to minimize the acceleration of the mass of a mechanism or portion thereof with respect to its frame or support. { 'shäk əb,zór·bər }

shock isolation [MECH ENG] The application of isolators to alleviate the effects of shock on a mechanical device or system. { 'shäk ˌī·sə,lā·shən }

Shockley diode [ELECTR] A *pnpn* silicon controlled switch having characteristics that permit operation as a unidirectional diode switch. { 'shäk·lē 'dī·ōd }

shock mount [MECH ENG] A mount used with sensitive equipment to reduce or prevent transmission of shock motion to the equipment. { 'shäk ˌmaůnt }

shock resistance [ENG] The property which prevents cracking or general rupture when impacted. { 'shäk ri,zis·təns }

shock test [ENG] The test to determine whether the armor sample will crack or spall under impact by kinetic energy or high-explosive projectiles. { 'shäk ˌtest }

shock tunnel [ENG] A hypervelocity wind tunnel in which a shock wave generated in a shock tube ruptures a second diaphragm in the throat of a nozzle at the end of the tube, and gases emerge from the nozzle into a vacuum tank with Mach numbers of 6 to 25. { 'shäk ˌtən·əl }

shoe [ENG] In glassmaking, an open-ended crucible placed in a furnace for heating the blowing irons. [MECH ENG] **1.** A metal block used as a form or support in various bending operations. **2.** A replaceable piece used to break rock in certain crushing machines. **3.** *See* brake shoe. { shü }

shoe brake [MECH ENG] A type of brake in which friction is applied by a long shoe, extending over a large portion of the rotating drum; the shoe may be external or internal to the drum. { 'shü ˌbrāk }

shoot [ENG] To detonate an explosive, used to break coal loose from a seam or in blasting operation or in a borehole. { shüt }

shooting board [ENG] **1.** A fixture used as a guide in planing boards; it is more accurate than a miter. **2.** A table and plane used for trimming printing plates. { 'shüd·iŋ ˌbȯrd }

shop fabrication [ENG] Making parts and materials in the shop rather than at the work site. { 'shäp ˌfab·rə,kā·shən }

shop standards [ENG] Written criteria established to govern methods and procedures at an installation. { 'shäp ˌstan·dərdz }

shop supplies [ENG] Expendable items consumed in operation and maintenance (for example, waste, oils, solvents, tape, packing, flux, or welding rod). { 'shäp sə,plīz }

shop weld [ENG] A weld made in the workshop prior to delivery to the construction site. { 'shäp ˌweld }

shore [ENG] Timber or other material used as a temporary prop for excavations or buildings; may be sloping, vertical, or horizontal. { shȯr }

Shore hardness [ENG] A method of rating the hardness of a metal or of a plastic or rubber material. { 'shȯr ˌhärd·nəs }

shore protection [CIV ENG] Preventing erosion of the ground bordering a body of water. { 'shȯr prə,tek·shən }

Shore scleroscope [ENG] A device used in rebound hardness testing of rubber, metal, and plastic; consists of a small, conical hammer fitted with a diamond point and acting in a glass tube. { 'shȯr 'skler·ə,skōp }

shoring [ENG] Providing temporary support with shores to a building or an excavation. { 'shȯr·iŋ }

short [ELEC] *See* short circuit. [ENG] In plastics injection molding, the failure to fill the mold completely. Also known as short shot. { shȯrt }

short circuit [ELEC] A low-resistance connection across a voltage source or between both sides of a circuit or line, usually accidental and usually resulting in excessive current flow that may cause damage. Also known as short. { 'shȯrt 'sər·kət }

short-circuiting transfer [ENG] Transfer of melted material from a consumable electrode during short circuits. { 'shȯrt ˌsər·kəd·iŋ 'tranz·fər }

short column [CIV ENG] A column in which both compression and bending is significant, generally having a slenderness ratio between 30 and 120–150. { 'shȯrt 'käl·əm }

shortcoming [DES ENG] An imperfection or malfunction occurring during the life cycle of equipment, which should be reported and which must be corrected to increase efficiency and to render the equipment completely serviceable. { 'shȯrt,kəm·iŋ }

short-delay blasting [ENG] A method of blasting by which explosive charges are detonated in a given sequence with short time intervals. { 'shȯrt di,lā 'blas·tiŋ }

short-delay detonator *See* millisecond delay cap. { 'shȯrt di,lā 'det·ən,ād·ər }

short fuse [ENG] **1.** Any fuse that is cut too short. **2.** The practice of firing a blast, the fuse on the primer of which is not sufficiently long to reach from the top of the charge to the collar of the borehole; the primer, with fuse attached, is dropped into the charge while burning. { 'shȯrt 'fyüz }

short leg [ENG] One of the wires on an electric blasting cap, which has been shortened so that when placed in the borehole, the two splices or connections will not come opposite each other and make a short circuit. { 'shȯrt 'leg }

short-range radar [ENG] Radar whose maximum line-of-sight range, for a reflecting target having 1 square meter of area perpendicular to the beam, is between 50 and 150 miles (80 and 240 kilometers). { 'shȯrt ˌrānj 'rā,där }

short residuum [CHEM ENG] A petroleum refinery term for residual oil from crude-oil distillation operations in which neutral oils are taken

overhead with the distillate. { 'shȯrt ri'zij·ə·wəm }

shorts [ENG] Oversize particles held on a screen after sieving the fines through the screen. { 'shȯrts }

short shipment [ENG] Freight listed or manifested but not received. { 'shȯrt 'ship·mənt }

short stop [CHEM ENG] A substance added during a polymerization process to terminate the reaction. { 'shȯrt ˌstäp }

short supply [IND ENG] An item is in short supply when the total of stock on hand and anticipated receipts during a given period is less than the total estimated demand during that period. { 'shȯrt sə'plī }

short-term repeatability [CONT SYS] The close agreement of positional movements of a robotic system repeated under identical conditions over a short period of time and at the same location. { 'shȯrt ˌtərm riˌpēd·ə'bil·əd·ē }

short ton *See* ton. { 'shȯrt 'tən }

short-tube vertical evaporator [CHEM ENG] A liquid evaporation process unit with a vertical bundle of tubes 2–3 inches (5–8 centimeters) in diameter and 4–6 feet (1.2–1.8 meters) long; the heating fluid is inside the tubes, and the liquid to be evaporated is in the shell area outside the tubes; used mainly to evaporate cane-sugar juice. Also known as calandria evaporator; Roberts evaporator; standard evaporator. { 'shȯrt ˌtüb 'vərd·ə·kəl i'vap·əˌrād·ər }

shot [ENG] **1.** A charge of some kind of explosive. **2.** Small spherical particles of steel. **3.** Small steel balls used as the cutting agent of a shot drill. **4.** The firing of a blast. **5.** In plastics molding, the yield from one complete molding cycle, including scrap. { shät }

shot bit [DES ENG] A short length of heavy-wall steel tubing with diagonal slots cut in the flat-faced bottom edge. { 'shät ˌbit }

shot boring [ENG] The act or process of producing a borehole with a shot drill. { 'shät ˌbȯr·iŋ }

shot break [ENG] In seismic prospecting, the electrical impulse which records the instant of explosion. { 'shät ˌbrāk }

shot capacity [ENG] The maximum weight of molten resin that an accumulator can push out with one forward stroke of the ram during plastics forming operations. { 'shät kəˌpas· əd·ē }

shotcreting [ENG] A process of conveying mortar or concrete through a hose at high velocity onto a surface; the material bonds tenaciously to a properly prepared concrete surface and to a number of other materials. { 'shätˌkrēd·iŋ }

shot depth [ENG] The distance from the surface to the charge. { 'shät ˌdepth }

shot drill *See* calyx drill. { 'shät ˌdril }

shot elevation [ENG] Elevation of the dynamite charge in the shot hole. { 'shät ˌel·əˌvā·shən }

shot feed [MECH ENG] A device to introduce chilled-steel shot, at a uniform rate and in the proper quantities, into the circulating fluid flowing downward through the rods or pipe connected to the core barrel and bit of a shot drill. { 'shät ˌfēd }

shothole [ENG] The borehole in which an explosive is placed for blasting. { 'shätˌhōl }

shothole casing [ENG] A lightweight pipe, usually about 4 inches (10 centimeters) in diameter and 10 feet (3 meters) long, with threaded connections on both ends, used to prevent the shothole from caving and bridging. { 'shätˌhōl ˌkās·iŋ }

shothole drill [MECH ENG] A rotary or churn drill for drilling shotholes. { 'shätˌhōl ˌdril }

shot mill [ENG] A high-speed, continuous mill for deagglomerating, dispersing, and milling paints, inks, dyestuffs, adhesives, food, and pharmaceuticals; consists of a chamber with rotating disks that is filled with small steel or ceramic spheres (shot), and a pump to propel material through the mill. Also know as a media mill. { 'shät ˌmil }

shot point [ENG] The point at which an explosion (such as in seismic prospecting) originates, generating vibrations in the ground. { 'shät ˌpȯint }

shot rock [ENG] Blasted rock. { 'shät ˌräk }

shoulder [DES ENG] The portion of a shaft, a stepped object, or a flanged object that shows an increase of diameter. [ENG] A projection made on a piece of shaped wood, metal, or stone, where its width or thickness is suddenly changed. { 'shōl·dər }

shoulder harness [ENG] A harness in a vehicle that fastens over the shoulders to prevent a person's being thrown forward in the seat. { 'shōl·dər ˌhär·nəs }

shoulder screw [DES ENG] A screw with an unthreaded cylindrical section, or shoulder, between threads and screwhead; the shoulder is larger in diameter than the threaded section and provides an axis around which close-fitting moving parts operate. { 'shōl·dər ˌskrü }

shovel [DES ENG] A hand tool having a flattened scoop at the end of a long handle for moving soil, aggregate, cement, or other similar material. [MECH ENG] A mechanical excavator. { 'shəv·əl }

shovel dozer *See* tractor loader. { 'shəv·əl ˌdōz·ər }

shovel loader [MECH ENG] A loading machine mounted on wheels, with a bucket hinged to the chassis which scoops up loose material, elevates it, and discharges it behind the machine. { 'shəv·əl ˌlōd·ər }

shrinkage [ENG] **1.** Contraction of a molded material, such as metal or resin, upon cooling. **2.** Contraction of a plastics casting upon polymerizing. { 'shriŋ·kij }

shrink fit [DES ENG] A tight interference fit between mating parts made by shrinking-on, that is, by heating the outer member to expand the bore for easy assembly and then cooling so that the outer member contracts. { 'shriŋk ˌfit }

shrink forming [DES ENG] Forming metal wherein the piece undergoes shrinkage during cooling following the application of heat, cold upset, or pressure. { 'shriŋk ˌfȯr·miŋ }

shrink ring [DES ENG] A heated ring placed on

an assembly of parts, which on subsequent cooling fixes them in position by contraction. { 'shriŋk ˌriŋ }

shrink wrapping [ENG] A technique of packaging with plastics in which the strains in plastics film are released by raising the temperature of the film, causing it to shrink-fit over the object being packaged. { 'shriŋk ˌrap·iŋ }

shroud [ENG] A protective covering, usually of metal plate or sheet. { shraùd }

shrouded propeller *See* ducted fan. { 'shraùd·əd prə'pel·ər }

shunt [CIV ENG] To shove or turn off to one side, as a car or train from one track to another. [ELEC] **1.** A precision low-value resistor placed across the terminals of an ammeter to increase its range by allowing a known fraction of the circuit current to go around the meter. Also known as electric shunt. **2.** To place one part in parallel with another. **3.** *See* parallel. { shənt }

shunt valve [ENG] A valve that gives a fluid under pressure a more readily available escape route than the normal route. { 'shənt ˌvalv }

shut-down circuit [ENG] An electronic, electric, or pneumatic system designed to shut off and close down process systems or equipment; can be used for routine or emergency situations. { 'shətˌdaùn ˌsər·kət }

shut height [MECH ENG] The distance in a press between the bottom of the slide and the top of the bed, indicating the maximum die height that can be accommodated. { 'shət ˌhīt }

shutoff head [MECH ENG] The pressure developed in a centrifugal or axial flow pump when there is zero flow through the system. { 'shətˌȯf ˌhed }

shutter dam [CIV ENG] A dam consisting of a series of pieces that can be lowered or raised by revolving them about their horizontal axis. { 'shəd·ər ˌdam }

shuttering *See* formwork. { 'shəd·ə·riŋ }

shuttle [MECH ENG] A back-and-forth motion of a machine which continues to face in one direction. { 'shəd·əl }

shuttle conveyor [MECH ENG] Any conveyor in a self-contained structure movable in a defined path parallel to the flow of the material. { 'shəd·əl kənˌvā·ər }

shuttling [ENG] A movement involving two or more trips or partial trips by the same motor vehicles between two points. { 'shəd·əl·iŋ }

Siacci method [MECH] An accurate and useful method for calculation of trajectories of high-velocity missiles with low quadrant angles of departure; basic assumptions are that the atmospheric density anywhere on the trajectory is approximately constant, and the angle of departure is less than about 15°. { sē'ä·chē ˌmeth·əd }

siamese blow [ENG] In the plastics industry, the blow molding of two or more parts of a product in a single blow, then cutting them apart. { sī·əˌmēz 'blō }

siamese connection [ENG] A Y-shaped standpipe installed close to the ground outside a building to provide two inlet connections for fire hoses to the standpipes and to the sprinkler system. { ˌsī·əˌmēz kə'nek·shən }

SIC *See* dielectric constant.

sickle [DES ENG] A hand tool consisting of a hooked metal blade with a short handle, used for cutting grain or other agricultural products. { 'sik·əl }

side bar [ENG] A bar on which molding pins are carried; operated from outside the mold. { 'sīd ˌbär }

side-channel spillway [CIV ENG] A dam spillway in which the initial and final flow are approximately perpendicular to each other. Also known as lateral flow spillway. { 'sīd ˌchan·əl 'spil ˌwā }

side direction [MECH] In stress analysis, the direction perpendicular to the plane of symmetry of an object. { 'sīd diˌrek·shən }

side draw pin [ENG] Projection used to core a hole in a molded article at an angle other than the line of mold closing; must be withdrawn before the article is ejected. { 'sīd 'drȯ ˌpin }

side-facing tool [ENG] A single-point cutting tool having a nose angle of less than 60° and used for finishing the tailstock end of work being machined between centers or the face of a workpiece mounted in a chuck. { 'sīd ˌfās·iŋ ˌtül }

sidehill bit [DES ENG] A drill bit which is set off-center so that it cuts a hole of larger diameter than that of the bit. { 'sīdˌhil ˌbit }

side hook *See* bench hook. { 'sīd ˌhůk }

side-looking radar [ENG] A high-resolution airborne radar having antennas aimed to the right and left of the flight path; used to provide high-resolution strip maps with photographlike detail, to map unfriendly territory while flying along its perimeter, and to detect submarine snorkels against a background of sea clutter. { 'sīd ˌlůk·iŋ 'rā·där }

side milling [MECH ENG] Milling with a side-milling cutter to machine one vertical surface. { 'sīd ˌmil·iŋ }

side-milling cutter [DES ENG] A milling cutter with teeth on one or both sides as well as around the periphery. { 'sīd ˌmil·iŋ 'kəd·ər }

side rake [MECH ENG] The angle between the tool face and a reference plane for a single-point turning tool. { 'sīd ˌrāk }

side relief angle [DES ENG] The angle that the portion of the flanks of a cutting tool below the cutting edge makes with a plane normal to the base. { 'sīd ri'lēf ˌaŋ·gəl }

side rod [MECH ENG] **1.** A rod linking the crankpins of two adjoining driving wheels on the same side of a locomotive; distributes power from the main rod to the driving wheels. **2.** One of the rods linking the piston-rod crossheads and the side levers of a side-lever engine. { 'sīd ˌräd }

siderograph [ENG] An instrument that keeps the time of the Greenwich longitude; consists of a clock and a navigation instrument. { 'sid·ə·rəˌgraf }

side shot [ENG] A reading or measurement from a survey station to locate a point that is

off the traverse or that is not intended to be used as a base for the extension of the survey. { 'sīd ˌshät }

side slope [ENG] A test course used to determine lateral stability of a vehicle as well as steering, carburetion, and other functions. { 'sīd ˌslōp }

sidestream [CHEM ENG] A liquid stream taken from an intermediate point of a liquids-processing unit, for example, a distillation or extraction tower. { 'sīdˌstrēm }

sidestream stripper [CHEM ENG] A device used to perform further distillation on a liquid stream (sidestream) from any one of the plates of a bubble tower, usually with the use of steam. { 'sīdˌstrēm 'strip·ər }

sidetrack [CIV ENG] **1.** To move railroad cars onto a siding. **2.** *See* siding. { 'sīdˌtrak }

sidetracking [ENG] The deliberate act or process of deflecting and drilling a borehole away from a normal, straight course. { 'sīdˌtrak·iŋ }

sidewalk [CIV ENG] **1.** A walkway for pedestrians on the side of a street or road. **2.** A foot pavement. { 'sīdˌwȯk }

sidewall section [ENG ACOUS] A wall in a sound-recording studio with reversible panels or rotating columns that are sound-absorbent on one side and reflective on the other, used to vary the acoustic environment. { 'sīdˌwȯl ˌsek·shən }

siding [CIV ENG] A short railroad track connected to the main track at one or more points and used to move railroad cars in order to free traffic on the main line or for temporary storage of cars. Also known as sidetrack. { 'sīd·iŋ }

siemens [ELEC] A unit of conductance, admittance, and susceptance, equal to the conductance between two points of a conductor such that a potential difference of 1 volt between these points produces a current of 1 ampere; the conductance of a conductor in siemens is the reciprocal of its resistance in ohms. Formerly known as mho (Ω); reciprocal ohm. Symbolized S. { 'sē·mənz }

sieve [ENG] **1.** A meshed or perforated device or sheet through which dry loose material is refined, liquid is strained, and soft solids are comminuted. **2.** A meshed sheet with apertures of uniform size used for sizing granular materials. { siv }

sieve analysis [ENG] The size distribution of solid particles on a series of standard sieves of decreasing size, expressed as a weight percent. Also known as sieve classification; sieving. { 'siv əˌnal·ə·səs }

sieve classification *See* sieve analysis. { 'siv ˌklas·ə·fəˌkā·shən }

sieve diameter [ENG] The size of a sieve opening through which a given particle will just pass. { 'siv dīˌam·əd·ər }

sieve fraction [ENG] That portion of solid particles which pass through a standard sieve of given number and is retained by a finer sieve of a different number. { 'siv ˌfrak·shən }

sieve mesh [DES ENG] The standard opening in sieve or screen, defined by four boundary wires (warp and woof); the laboratory mesh is square and is defined by the shortest distance between two parallel wires as regards aperture (quoted in micrometers or millimeters), and by the number of parallel wires per linear inch as regards mesh; 60-mesh equals 60 wires per inch. { 'siv ˌmesh }

sieve plate [CHEM ENG] A distillation-tower tray that is perforated so that the vapor emerges vertically through the tray, passing through the liquid holdup on top of the tray; used as a replacement for bubble-cap trays in distillation. Also known as sieve tray. { 'siv ˌplāt }

sieve shaker [CHEM ENG] A device used to shake a stacked column of standard sieve-test trays to cause solids to sift progressively from the top (large openings) to the bottom (small openings and a final pan), according to particle size. { 'siv ˌshā·kər }

sieving *See* sieve analysis. { 'siv·iŋ }

sight-feed [ENG] Pertaining to piping in which the flowing liquid can be observed through a transparent tube or wall. { 'sītˌfēd }

sight glass [ENG] A glass tube or a glass-faced section on a process line or vessel; used for visual reading of liquid levels or of manometer pressures. { 'sīt ˌglas }

sighting tube [ENG] A tube, usually ceramic, inserted into a hot chamber whose temperature is to be measured; an optical pyrometer is sighted into the tube to observe the interior end of the tube to give a temperature reading. { 'sīd·iŋ ˌtüb }

sight rod *See* range rod. { 'sīt ˌräd }

sigma-delta analog-to-digital converter [ELECTR] A converter that uses an analog circuit to generate a single-valued pulse stream in which the frequency of pulses is determined by the analog source, and then uses a digital circuit to repeatedly sum the number of these pulses over a fixed time interval, converting the pulses to numeric values. { ¦sig·mə ¦del·tə ˌan·əˌläg tü ˌdij·əd·əl kənˌvərd·ər }

sigma-delta converter [ELECTR] A class of electronic systems containing both analog and digital subsystems whose most common application is the conversion of analog signals to digital form, and vice versa, using pulse density modulation to create a high-rate stream of single-amplitude pulses in either case. Also known as delta-sigma converter. { ˌsig·mə ˌdel·tə kən 'vərd·ər }

sigma-delta digital-to-analog converter [ELECTR] A converter that uses a digital circuit to convert numeric values from a digital processor to a pulse stream and then uses an analog low-pass filter to produce an analog waveform. { ¦sig·mə ¦del·tə ˌdij·əd·əl tü ˌan·əˌläg kən'vərd·ər }

sigma-delta modulator [ELECTR] The circuit used to generate a pulse stream in a sigma-delta converter. Also known as delta-sigma modulator. { ˌsig·mə ˌdel·tə 'mäj·əˌlād·ər }

sigma function [THERMO] A property of a mixture of air and water vapor, equal to the difference between the enthalpy and the product of the specific humidity and the enthalpy of water (liquid) at the thermodynamic wet-bulb temperature; it is constant for constant barometric pressure and thermodynamic wet-bulb temperature. { 'sig·mə ˌfəŋk·shən }

signal correction [ENG] In seismic analysis, a correction to eliminate the time differences between reflection times, resulting from changes in the outgoing signal from shot to shot. { 'sig·nəl kəˌrek·shən }

signal effect [ENG] In seismology, variation in arrival times of reflections recorded with identical filter settings, as a result of changes in the outgoing signal. { 'sig·nəl iˌfekt }

signal flare [ENG] A pyrotechnic flare of distinct color and character used as a signal. { 'sig·nəl ˌfler }

signal-flow graph [SYS ENG] An abbreviated block diagram in which small circles, called nodes, represent variables of the system, and the nodes are connected by lines, called branches, which represent one-way signal multipliers; an arrow on the line indicates direction of signal flow, and a letter near the arrow indicates the multiplication factor. Also known as flow graph. { 'sig·nəl ˌflō ˌgraf }

signal generator [ENG] An electronic test instrument that delivers a sinusoidal output at an accurately calibrated frequency that may be anywhere from the audio to the microwave range; the frequency and amplitude are adjustable over a wide range, and the output usually may be amplitude- or frequency-modulated. Also known as test oscillator. { 'sig·nəl ˌjen·əˌrād·ər }

signaling key *See* key. { 'sig·nə·liŋ ˌkē }

signal light [ENG] A signal, illumination, or any pyrotechnic light used as a sign. { 'sig·nəl ˌlīt }

signal-to-interference ratio [ELECTR] The relative magnitude of signal waves and waves which interfere with signal-wave reception. { 'sig·nəl tü ˌin·tərˈfir·ənsˌrā·shō }

signal-to-noise ratio [ELECTR] The ratio of the amplitude of a desired signal at any point to the amplitude of noise signals at that same point; often expressed in decibels; the peak value is usually used for pulse noise, while the root-mean-square (rms) value is used for random noise. Abbreviated S/N; SNR. { 'sig·nəl tə 'nȯizˌrā·shō }

signal tower [CIV ENG] A switch tower from which railroad signals are displayed or controlled. { 'sig·nəl ˌtaù·ər }

signal voltage [ELEC] Effective (root-mean-square) voltage value of a signal. { 'sig·nəl ˌvōl·tij }

silent speed [ENG] The speed at which silent motion pictures are fed through a projector, equal to 16 frames per second (sound-film speed is 24 frames per second). { 'sī·lənt 'spēd }

silent stock support [MECH ENG] A flexible metal guide tube in which the stock tube of an automatic screw machine rotates; it is covered with a casing which deadens sound and prevents transfer of noise and vibration. { 'sī·lənt 'stäk səˌpȯrt }

silicate grinding wheel [DES ENG] A mild-acting grinding wheel where the abrasive grain is bonded with sodium silicate and fillers. { 'sil·ə·kət 'grīnd·iŋ ˌwēl }

silicide resistor [ELECTR] A thin-film resistor that uses a silicide of molybdenum or chromium, deposited by direct-current sputtering in an integrated circuit when radiation hardness or high resistance values are required. { 'sil·əˌsīd riˈzis·tər }

silicon capacitor [ELECTR] A capacitor in which a pure silicon-crystal slab serves as the dielectric; when the crystal is grown to have a *p* zone, a depletion zone, and an *n* zone, the capacitance varies with the externally applied bias voltage, as in a varactor. { 'sil·ə·kən kəˈpas·əd·ər }

silicon diode [ELECTR] A crystal diode that uses silicon as a semiconductor; used as a detector in ultra-high- and super-high-frequency circuits. Also known as silicon detector. { 'sil·ə·kən 'dīˌōd }

silicon homojunction *See* bipolar junction transistor. { ˌsil·ə·kən 'hä·məˌjəŋk·shən }

silicon-on-insulator [ELECTR] A semiconductor manufacturing technology in which thin films of single-crystalline silicon are grown over an electrically insulating substrate. { 'sil·ə·kən ȯn 'in·səˌlād·ər }

silicon-on-sapphire [ELECTR] A semiconductor manufacturing technology in which metal oxide semiconductor devices are constructed in a thin single-crystal silicon film grown on an electrically insulating synthetic sapphire substrate. Abbreviated SOS. { 'sil·ə·kən ȯn 'saˌfīr }

silicon rectifier [ELECTR] A metallic rectifier in which rectifying action is provided by an alloy junction formed in a high-purity silicon slab. { 'sil·ə·kən 'rek·təˌfī·ər }

silicon resistor [ELECTR] A resistor using silicon semiconductor material as a resistance element, to obtain a positive temperature coefficient of resistance that does not appreciably change with temperature; used as a temperature-sensing element. { 'sil·ə·kən riˈzis·tər }

silicon retina [ELECTR] An analog very large scale integrated circuit chip that performs operations which resemble some of the functions performed by the retina of the human eye. { ˌsil·əˌkän 'ret·ən·ə }

silicon solar cell [ELECTR] A solar cell consisting of *p* and *n* silicon layers placed one above the other to form a *pn* junction at which radiant energy is converted into electricity. { 'sil·ə·kən 'sō·lər 'sel }

silicon transistor [ELECTR] A transistor in which silicon is used as the semiconducting material. { 'sil·ə·kən tranˈzis·tər }

sill [BUILD] The lowest horizontal member of a framed partition or of a window or door frame. [CIV ENG] **1.** A timber laid across the foot of a trench or a heading under the side truss.

2. The horizontal overflow line of a dam spillway or other weir structure. **3.** A horizontal member on which a lift gate rests when closed. **4.** A low concrete or masonry dam in a small stream to retard bottom erosion. [CONT SYS] A type of robot articulation that has three degrees of freedom. { sil }

sill anchor [BUILD] A fastener projecting from a foundation wall or foundation slab to secure the sill to the foundation. { 'sil ˌaŋ·kər }

silo [CIV ENG] A large vertical, cylindrical structure, made of reinforced concrete, steel, or timber, and used for storing grain, cement, or other materials. { 'sī·lō }

silting [CIV ENG] The filling up or raising of the bed of a body of water by depositing silt. { 'silt·iŋ }

silting index [ENG] The measurement of the tendency of a solids- or gel-carrying fluid to cause silting in close-tolerance devices, such as valves or other process-line flow constrictions. { 'silt·iŋ ˌinˌdeks }

silver-disk pyrheliometer [ENG] An instrument used for the measurement of direct solar radiation; it consists of a silver disk located at the lower end of a diaphragmed tube which serves as the radiation receiver for a calorimeter; radiation falling on the silver disk is periodically intercepted by means of a shutter located in the tube, causing temperature fluctuations of the calorimeter which are proportional to the intensity of the radiation. { 'sil·vər 'disk ˌpīrˌhē·lē'äm·əd·ər }

silvered mica capacitor [ELECTR] A mica capacitor in which a coating of silver is deposited directly on the mica sheets to serve in place of conducting metal foil. { 'sil·vərd ˌmī·kə kə'pas·əd·ər }

silver migration [ELEC] A process, causing reduction in insulation resistance and dielectric failure; silver, in contact with an insulator, at high humidity, and subjected to an electrical potential, is transported ionically from one location to another. { 'sil·vər mī'grā·shən }

similarity principle *See* principle of dynamical similarity. { ˌsim·ə'lar·əd·ē ˌprin·sə·pəl }

similitude [ENG] A likeness or resemblance; for example, the scale-up of a chemical process from a laboratory or pilot-plant scale to a commercial scale. { si'mil·əˌtüd }

simmer [ENG] The detectable leakage of fluid in a safety valve below the popping pressure. { 'sim·ər }

simo chart [IND ENG] A basic motion-time chart used to show the simultaneous nature of motions; commonly a therblig chart for two-hand work with motion symbols plotted vertically with respect to time, showing the therblig abbreviation and a brief description for each activity, and individual times values and body-member detail. Also known as simultaneous motion-cycle chart. { 'sī·mō ˌchärt }

Simon's theory [ENG] A theory of drilling which includes the effects of drilling by percussion and by vibration with a rotary (oil well) bit, cable tool, and pneumatic hammer; the rate of penetration of a chisel-shaped bit into brittle rock may be defined as follows: $R = NAf_v/\pi D$, where R equals the rate of advance of bit, N equals the number of wings of bit, f_v equals the number of impacts per unit time, D equals the diameter of the bit, and A equals the cross-sectional area of the crater at the periphery of the drill hole. { 'sī·mənz ˌthē·ə·rē }

simple balance [ENG] An instrument for measuring weight in which a beam can rotate about a knife-edge or other point of support, the unknown weight is placed in one of two pans suspended from the ends of the beam and the known weights are placed in the other pan, and a small weight is slid along the beam until the beam is horizontal. { 'sim·pəl 'bal·əns }

simple continuous distillation *See* equilibrium flash vaporization. { 'sim·pəl kən'tin·yə·wəs ˌdis·tə'lā·shən }

simple engine [MECH ENG] An engine (such as a steam engine) in which expansion occurs in a single phase, after which the working fluid is exhausted. { 'sim·pəl 'en·jən }

simple harmonic motion *See* harmonic motion. { 'sim·pəl här'män·ik 'mō·shən }

simple machine [MECH ENG] Any of several elementary machines, one or more being incorporated in every mechanical machine; usually, only the lever, wheel and axle, pulley (or block and tackle), inclined plane, and screw are included, although the gear drive and hydraulic press may also be considered simple machines. { 'sim·pəl mə'shēn }

simple pendulum [MECH] A device consisting of a small, massive body suspended by an inextensible object of negligible mass from a fixed horizontal axis about which the body and suspension are free to rotate. { 'sim·pəl 'pen·jə·ləm }

simplex concrete pile [CIV ENG] A molded-in-place pile made by using a hollow cylindrical mandrel which is filled with concrete after having been driven to the desired depth and raised a few feet at a time, the concrete flowing out at the bottom and filling the hole in the earth. { 'simˌpleks 'känˌkrēt 'pīl }

simplex pump [MECH ENG] A pump with only one steam cylinder and one water cylinder. { 'simˌpleks ˌpəmp }

SIMS *See* secondary ion mass spectrometer. { simz }

simulate [ENG] To mimic some or all of the behavior of one system with a different, dissimilar system, particularly with computers, models, or other equipment. { 'sim·yəˌlāt }

simulator [ENG] A computer or other piece of equipment that simulates a desired system or condition and shows the effects of various applied changes, such as a flight simulator. { 'sim·yəˌlād·ər }

simultaneity [MECH] Two events have simultaneity, relative to an observer, if they take place at the same time according to a clock which is

fixed relative to the observer. { ˌsī·məl·tə'nē·əd·ē }

simultaneous motion-cycle chart *See* simo chart. { ˌsī·məl'tā·nē·əs 'mō·shən ˌsī·kəl ˌchärt }

sine bar [DES ENG] A device consisting of a steel straight edge with two cylinders of equal diameter attached near the ends with their centers equidistant from the straightedge; used to measure angles accurately and to lay out work at a desired angle in relationship to a surface. { 'sīn ˌbär }

sine galvanometer [ENG] A type of magnetometer in which a small magnet is suspended in the center of a pair of Helmholtz coils, and the rest position of the magnet is measured when various known currents are sent through the coils. { 'sīn ˌgal·və'näm·əd·ər }

sine-wave response *See* frequency response. { 'sīn ˌwāv ri'spdäns }

singing [CONT SYS] An undesired, self-sustained oscillation in a system or component, at a frequency in or above the passband of the system or component; generally due to excessive positive feedback. { 'siŋ·iŋ }

singing margin [CONT SYS] The difference in level, usually expressed in decibels, between the singing point and the operating gain of a system or component. { 'siŋ·iŋ ˌmär·jən }

singing point [CONT SYS] The minimum value of gain of a system or component that will result in singing. { 'siŋ·iŋ ˌpȯint }

single acting [MECH ENG] Acting in one direction only, as a single-acting plunger, or a single-acting engine (admitting the working fluid on one side of the piston only). { 'siŋ·gəl 'akt·iŋ }

single-action press [MECH ENG] A press having a single slide. { 'siŋ·gəl ˌak·shən 'pres }

single-axis gyroscope [ENG] A gyroscope suspended in just one gimbal whose bearings form its output axis; an example is a rate gyroscope. { 'siŋ·gəl ˌak·səs 'jī·rəˌskōp }

single-block brake [MECH ENG] A friction brake consisting of a short block fitted to the contour of a wheel or drum and pressed up against the surface by means of a lever on a fulcrum; used on railroad cars. { 'siŋ·gəl ˌblāk 'brāk }

single-button carbon microphone [ENG ACOUS] Microphone having a carbon-filled buttonlike container on only one side of its flexible diaphragm. { 'siŋ·gəl ˌbət·ən 'kär·bən 'mī·krəˌfōn }

single-cut file [DES ENG] A file with one set of parallel teeth, extending diagonally across the face of the file. { 'siŋ·gəl ˌkət 'fīl }

single-degree-of-freedom gyro [MECH] A gyro the spin reference axis of which is free to rotate about only one of the orthogonal axes, such as the input or output axis. { 'siŋ·gəl diˌgrē əv ˌfrē·dəm 'jī·rō }

single-edged push-pull amplifier circuit [ELECTR] Amplifier circuit having two transmission paths designed to operate in a complementary manner and connected to provide a single unbalanced output without the use of an output transformer. { 'siŋ·gəl ˌejd ˌpůsh ˌpůl 'am·pləˌfī·ər ˌsər·kət }

single-effect evaporation [CHEM ENG] An evaporation process completed entirely in one vessel or by means of a single heating unit. { 'siŋ·gəl iˌfekt iˌvap·ə'rā·shən }

single-electron transistor [ELECTR] A transistor whose dimensions are extremely small, in the nanometer range, causing it to exhibit characteristics that are sensitive to the transport and storage of single electrons. { ˌsiŋ·gəl iˌlek·trän tran'zis·tər }

single-ended signal [ELECTR] A circuit signal that is the voltage difference between two nodes, one of which can be defined as being at ground or reference voltage. { ˌsiŋ·gəl ˌen·dəd 'sig·nəl }

single-ended spread [ENG] A spread of geophones in which the shot point is located at one end of the arrangement. { ˌsiŋ·gəl ˌend·əd 'spred }

single-hand drilling [ENG] A method of rock drilling in which the drill steel, which is held in the hand, is struck with a 4-pound (1.8-kilogram) hammer, the drill being turned between the blows. { 'siŋ·gəl ˌhan 'dril·iŋ }

single in-line package [ELECTR] A packaged resistor network or other assembly that has a single row of terminals or lead wires along one edge of the package. Abbreviated SIP. { 'siŋ·gəl 'inˌlīn 'pak·ij }

single-layer bit *See* surface-set bit. { 'siŋ·gəl ˌlā·ər 'bit }

single-loop feedback [CONT SYS] A system in which feedback may occur through only one electrical path. { 'siŋ·gəl ˌlüp 'fēdˌbak }

single-loop servomechanism [CONT SYS] A servomechanism which has only one feedback loop. Also known as servo loop. { 'siŋ·gəl ˌlüp 'sər·vōˌmek·əˌniz·əm }

single-phase [ELEC] Energized by a single alternating voltage. { 'siŋ·gəl 'fāz }

single-phase circuit [ELEC] Either an alternating-current circuit which has only two points of entry, or one which, having more than two points of entry, is intended to be so energized that the potential differences between all pairs of points of entry are either in phase or differ in phase by 180°. { 'siŋ·gəl ˌfāz 'sər·kət }

single-phase flow [CHEM ENG] The flow of a material, as a gas, single-phase liquid, or a solid, but not in any combination of the three. { 'siŋ·gəl ˌfāz 'flō }

single-phase meter [ENG] A type of power-factor meter that contains a fixed coil that carries the load current, and crossed coils that are connected to the load voltage; there is no spring to restrain the moving system, which takes a position to indicate the angle between the current and voltage. { 'siŋ·gəl ˌfāz 'mēd·ər }

single-phase motor [ELEC] A motor energized by a single alternating voltage. { 'siŋ·gəl ˌfāz 'mōd·ər }

single-piece milling [MECH ENG] A milling method whereby one part is held and milled in one machine cycle. { 'siŋ·gəl ˌpēs 'mil·iŋ }

single-point grounding [ELEC] Grounding system that attempts to confine all return currents to a network that serves as the circuit reference;

to be effective, no appreciable current is allowed to flow in the circuit reference, that is, the sum of the return currents is zero. { 'siŋ·gəl ¦pȯint 'graünd·iŋ }

single-point tool [ENG] A cutting tool having one face and one continuous cutting edge. { 'siŋ·gəl ¦pȯint 'tül }

single-pole double-throw [ELEC] A three-terminal switch or relay contact arrangement that connects one terminal to either of two other terminals. Abbreviated SPDT. { 'siŋ·gəl 'pōl 'dəb·əl 'thrō }

single-pole single-throw [ELEC] A two-terminal switch or relay contact arrangement that opens or closes one circuit. Abbreviated SPST. { 'siŋ·gəl 'pōl 'siŋ·gəl 'thrō }

single sampling [IND ENG] A sampling inspection in which the lot is accepted or rejected on the basis of one sample. { 'siŋ·gəl 'sam·pliŋ }

single-shot blocking oscillator [ELECTR] Blocking oscillator modified to operate as a single-shot trigger circuit. { 'siŋ·gəl ¦shät 'bläk·iŋ 'äs·ə,lād·ər }

single-shot exploder [ENG] A magneto exploder operated by the twist action given by a half turn of the firing key. { 'siŋ·gəl ¦shät ik 'splōd·ər }

single-shot multivibrator *See* monostable multivibrator. { 'siŋ·gəl ¦shät ¦məl·ti'vī,brād·ər }

single-shot trigger circuit [ELECTR] Trigger circuit in which one triggering pulse initiates one complete cycle of conditions ending with a stable condition. Also known as single-trip trigger circuit. { 'siŋ·gəl ¦shät 'trig·ər ˌsər·kət }

single-sided amplifier *See* single-end amplifier. { 'siŋ·gəl ¦sīd·əd 'am·plə,fī·ər }

single-sided board [ELECTR] A printed wiring board that contains all of the interconnect material on one of the external layers. { ˌsiŋ·gəl ¦sīd·əd 'bȯrd }

single-stage compressor [MECH ENG] A machine that effects overall compression of a gas or vapor from suction to discharge conditions without any sequential multiplicity of elements, such as cylinders or rotors. { 'siŋ·gəl ¦stāj kəm'pres·ər }

single-stage pump [MECH ENG] A pump in which the head is developed by a single impeller. { 'siŋ·gəl ¦stāj 'pəmp }

single thread [DES ENG] A screw thread having a single helix in which the lead and pitch are equal. { 'siŋ·gəl 'thred }

single-throw switch [ELEC] A switch in which the same pair of contacts is always opened or closed. { 'siŋ·gəl ¦thrō 'swich }

single-trip trigger circuit *See* single-shot trigger circuit. { 'siŋ·gəl ¦trip 'trig·ər ˌsər·kət }

single-tuned amplifier [ELECTR] An amplifier characterized by resonance at a single frequency. { 'siŋ·gəl ¦tünd 'am·plə,fī·ər }

single-unit semiconductor device [ELECTR] Semiconductor device having one set of electrodes associated with a single carrier stream. { 'siŋ·gəl ¦yü·nət 'sem·i·kən,dək·tər di,vīs }

singular arc [CONT SYS] In an optimal control problem, that portion of the optimal trajectory in which the Hamiltonian is not an explicit function of the control inputs, requiring higher-order necessary conditions to be applied in the process of solution. { 'siŋ·gyə·lər 'ärk }

sink-float separation process [ENG] A simple gravity process used in ore dressing that separates particles of different sizes or composition on the basis of differences in specific gravity. { 'siŋk 'flōt ˌsep·ə'rā·shən ˌprä·səs }

sinking fund [IND ENG] A fund established by periodically depositing funds at compound interest in order to accumulate a given sum at a given future time for some specific purpose. { 'siŋk·iŋ ˌfənd }

sink mark [ENG] A shallow depression or dimple on the surface of an injection-molded plastic part due to collapsing of the surface following local internal shrinkage after the gate seals. { 'siŋk ˌmärk }

sinter setting *See* mechanical setting. { 'sin·tər ˌsed·iŋ }

sinusoidal current *See* simple harmonic current. { ˌsī·nə'sȯid·əl 'kə·rənt }

SIP *See* single in-line package. { sip }

siphon [ENG] A tube, pipe, or hose through which a liquid can be moved from a higher to a lower level by atmospheric pressure forcing it up the shorter leg while the weight of the liquid in the longer leg causes continuous downward flow. { 'sī·fən }

siphon barograph [ENG] A recording siphon barometer. { 'sī·fən 'bar·ə,graf }

siphon barometer [ENG] A J-shaped mercury barometer in which the stem of the J is capped and the cusp is open to the atmosphere. { 'sī·fən bə'räm·əd·ər }

siphon recorder [ENG] A recorder in which a small siphon discharges ink to make the record; used in submarine telegraphy. { 'sī·fən ri 'kȯrd·ər }

siphon spillway [CIV ENG] An enclosed spillway passing over the crest of a dam in which flow is maintained by atmospheric pressure. { 'sī·fən 'spil,wā }

siren [ENG ACOUS] An apparatus for generating sound by the mechanical interruption of the flow of fluid (usually air) by a perforated disk or cylinder. { 'sī·rən }

sister hook [DES ENG] **1.** Either of a pair of hooks which can be fitted together to form a closed ring. **2.** A pair of such hooks. { 'sis·tər ˌhůk }

site [ENG] Position of anything; for example, the position of a gun emplacement. { sīt }

six-axis system [MECH ENG] A robot that has six degrees of freedom, three rectangular and three rotational. { 'siks ¦ak·səs 'sis·təm }

six-phase circuit [ELEC] Combination of circuits energized by alternating electromotive forces which differ in phase by one-sixth of a cycle (60°). { 'siks ¦fāz 'sər·kət }

Six's thermometer [ENG] A combination maximum thermometer and minimum thermometer; the tube is shaped in the form of a U with a bulb

at either end; one bulb is filled with creosote which expands or contracts with temperature variation, forcing before it a short column of mercury having iron indexes at either end; the indexes remain at the extreme positions reached by the mercury column, thus indicating the maximum and minimum temperatures; the indexes can be reset with the aid of a magnet. { 'sik·səz thər,mäm·əd·ər }

six-tenths factor [IND ENG] An empirical relationship between the cost and the size of a manufacturing facility; as size increases, cost increases by an exponent of six-tenths, that is $cost_1/cost_2 = (size_1/size_2)^{0.6}$. { 'siks ¦tenths ˌfak·tər }

sixty degrees Fahrenheit British thermal unit *See* British thermal unit. { 'siks·tē di¦grēz 'far·ən,hīt 'brid·ish 'thər·məl ˌyü·nət }

size analysis *See* particle-size analysis. { 'sīz ə,nal·ə·səs }

size block *See* gage block. { 'sīz ˌbläk }

size classification *See* sizing. { 'sīz ˌklas·ə·fə,kā·shən }

size dimension [DES ENG] In dimensioning, a specified value of a diameter, width, length, or other geometrical characteristic directly related to the size of an object. { 'sīz di,men·shən }

size enlargement [CHEM ENG] Making large particles out of small ones by crystallization, particle cementation, tableting, briquetting, agglomeration, flocculation, melting, casting, compaction and extrusion, and sintering or nodulizing. { 'sīz in,lärj·mənt }

size-frequency analysis *See* particle-size analysis. { 'sīz 'frē·kwən·sē ə,nal·ə·səs }

size reduction [MECH ENG] The breaking of large pieces of coal, ore, or stone by a primary breaker, or of small pieces by grinding equipment. { 'sīz ri,dək·shən }

sizing [ENG] **1.** Separating an aggregate of mixed particles into groups according to size, using a series of screens. Also known as size classification. **2.** *See* sizing treatment. [MECH ENG] A finishing operation to correct surfaces and shapes to meet specified dimensions and tolerances. { 'sīz·iŋ }

sizing screen [DES ENG] A mesh sheet with standard-size apertures used to separate granular material into classes according to size; the Tyler standard screen is an example. { 'sīz·iŋ ˌskrēn }

sizing treatment [ENG] Also known as sizing; surface sizing. **1.** Application of material to a surface to fill pores and thus reduce the absorption of subsequently applied adhesive or coating; used for textiles, paper, and other porous materials. **2.** Surface-treatment applied to glass fibers used in reinforced plastics. { 'sīz·iŋ ˌtrēt·mənt }

Sk *See* Stefan number.

skeleton framing [BUILD] Framing in which steel framework supports all the gravity loading of the structure; this system is used for skyscrapers. { 'skel·ət·ən ˌfrām·iŋ }

skew [ELECTR] **1.** The deviation of a received facsimile frame from rectangularity due to lack of synchronism between scanner and recorder; expressed numerically as the tangent of the angle of this deviation. **2.** The degree of nonsynchronism of supposedly parallel bits when bit-coded characters are read from magnetic tape. [MECH ENG] Gearing whose shafts are neither interesecting nor parallel. { skyü }

skewback [CIV ENG] The beveled or inclined support at each end of a segmental arch. { 'skyü ˌbak }

skew bridge [CIV ENG] A bridge which spans a gap obliquely and is therefore longer than the width of the gap. { 'skyü ˌbrij }

skew chisel [ENG] A tool used for wood turning that has a straight cutting edge sharpened at an angle to the shank. { 'skyü ˌchiz·əl }

skewed bridge [CIV ENG] A bridge for which the deck in plan is a parallelogram. { 'skyüd 'brij }

skew level gear [DES ENG] A level gear whose axes are not in the same place. { 'skyü 'lev·əl ˌgir }

skid [ENG] **1.** A device attached to a chain and placed under a wheel to prevent its turning when descending a steep hill. **2.** A timber, bar, rail, or log placed under a heavy object when it is being moved over bare ground. **3.** A wood or metal platform support on wheels, legs, or runners used for handling and moving material. Also known as skid platform. [MECH ENG] A brake for a power machine. { skid }

skid-mounted [ENG] Equipment or processing systems mounted on a portable platform. { 'skid,maùnt·əd }

skim coat [BUILD] A finish coat of plaster composed of lime putty and fine white sand. { 'skim ˌkōt }

skimming plant [CHEM ENG] A petroleum refinery designed to remove and finish only the lighter constituents of crude oil, such as gasoline and kerosine; the heavy ends are sold as fuel oil or for further processing elsewhere. { 'skim·iŋ ˌplant }

skin [BUILD] The exterior wall of a building. [ENG] In flexible bag molding, a protective covering for the mold; it may consist of a thin piece of plywood or a thin hardwood. { skin }

skin diving [ENG] Diving without breathing apparatus, using fins and faceplate only. { 'skin ˌdīv·iŋ }

skintle [CIV ENG] To set bricks in an irregular fashion so that they are out of alignment with the face by 1/4 inch (6 millimeters) or more. { 'skint·əl }

skip *See* skip hoist. { skip }

skip distance [ENG] In angle-beam ultrasonic testing, the distance between the point of entry on the workpiece and the point of first reflection. { 'skip ˌdis·təns }

skip hoist [MECH ENG] A basket, bucket, or open car mounted vertically or on an incline on wheels, rails, or shafts and hoisted by a cable; used to raise materials. Also known as skip. { 'skip ˌhȯist }

skip logging [ENG] A phenomenon during

acoustical (sonic) logging in which the acoustical energy is attenuated by low-elasticity formations and lacks the energy to trip the second sonic receiver (skips a cycle). Also known as cycle skip. { 'skip ˌläg·iŋ }

skip trajectory [MECH] A trajectory made up of ballistic phases alternating with skipping phases; one of the basic trajectories for the unpowered portion of the flight of a reentry vehicle or spacecraft reentering earth's atmosphere. { 'skip trəˌjek·trē }

skirt *See* baseboard. { skərt }

skirting *See* baseboard. { 'skərd·iŋ }

skirting block [BUILD] Also known as base block; plinth block. **1.** A corner block where a base strip and vertical enframement meet. **2.** A concealed block to which a baseboard is anchored. { 'skərd·iŋ ˌbläk }

skirt roof [BUILD] A false band of roofing projecting from between the stories of a building. { 'skərt ˌrüf }

skiving [MECH ENG] **1.** Removal of material in thin layers or chips with a high degree of shear or slippage of the cutting tool. **2.** A machining operation in which the cut is made with a form tool with its face at an angle allowing the cutting edge to progress from one end of the work to the other as the tool feeds tangentially past ten rotating workpieces. { 'skīv·iŋ }

skull cracker [ENG] A heavy iron or steel ball that can be swung freely or dropped by a derrick to raze buildings or to compress bulky scrap. Also known as wrecking ball. { 'skəl ˌkrak·ər }

skylight [ENG] An opening in a roof or ship deck that is covered with glass or plastic and designed to admit daylight. { 'skīˌlīt }

skyscraper [BUILD] A very tall, multistory building. { 'skīˌskrāp·ər }

slab [CIV ENG] That part of a reinforced concrete floor, roof, or platform which spans beams, columns, walls, or piers. [ELECTR] A relatively thick-cut crystal from which blanks are obtained by subsequent transverse cutting. [ENG] The outside piece cut from a log when sawing it into boards. { slab }

slabbing cutter [MECH ENG] A face-milling cutter used to make wide, rough cuts. { 'slab·iŋ ˌkəd·ər }

slab cutter *See* plain milling cutter. { 'slab ˌkəd·ər }

slabstone *See* slab. { 'slabˌstōn }

slack [ENG] Looseness or play in a mechanism, as the play in the trigger of a small-arms weapon. { slak }

slackline cableway [MECH ENG] A machine, widely used in sand-and-gravel plants, employing an open-ended dragline bucket suspended from a carrier that runs upon a track cable, which can dig, elevate, and convey materials in one continuous operation. { 'slakˌlīn 'kā·bəlˌwā }

slack time [ENG] For an activity in a PERT or critical-path-method network, the difference between the latest possible completion time of each activity which will not delay the completion of the overall project, and the earliest possible completion time, based on all predecessor activities. { 'slak ˌtīm }

slamming stile [BUILD] The vertical strip that a closed door abuts; it receives the bolt when the lock engages. { 'slam·iŋ ˌstīl }

slant depth [DES ENG] The distance between the crest and root of a screw thread measured along the angle forming the flank of the thread. { 'slant ˌdepth }

slant drilling [ENG] The drilling of a borehole or well at an angle to the vertical. { 'slant ˌdril·iŋ }

slat conveyor [MECH ENG] A conveyor consisting of horizontal slats on an endless chain. { 'slat kənˌvā·ər }

slave [CONT SYS] A device whose motions are governed by instructions from another machine. { slāv }

slave arm [ENG] A component of a remote manipulator that automatically duplicates the motions of a master arm, sometimes with changes of scale in displacement or force. { 'slāv ˌärm }

sled [ENG] An item equipped with runners and a suitable body designed to transport loads over ice and snow. { sled }

sledgehammer [DES ENG] A large heavy hammer that is usually wielded with two hands; used for driving stakes or breaking stone. { 'slej ˌham·ər }

sleeper [CIV ENG] A timber, steel, or precast concrete beam placed under rails to hold them at the correct gage. { 'slēp·ər }

sleeve [ELEC] **1.** The cylindrical contact that is farthest from the tip of a phone plug. **2.** Insulating tubing used over wires or components. Also known as bushing; sleeving. [ENG] A cylindrical part designed to fit over another part. { slēv }

sleeve bearing [MECH ENG] A machine bearing in which the shaft turns and is lubricated by a sleeve. { 'slēv ˌber·iŋ }

sleeve burner [ENG] A type of oil burner for domestic heating. { 'slēv ˌbər·nər }

sleeve coupling [DES ENG] A hollow cylinder which fits over the ends of two shafts or pipes, thereby joining them. { 'slēv ˌkəp·liŋ }

sleeve joint [DES ENG] A device for joining the ends of two wires or cables together, constructed by forcing the ends of the wires or cables into both ends of a hollow sleeve. { 'slēv ˌjȯint }

sleeve valve [MECH ENG] An admission and exhaust valve on an internal-combustion engine consisting of one or two hollow sleeves that fit around the inside of the cylinder and move with the piston so that their openings align with the inlet and exhaust ports in the cylinder at proper stages in the cycle. { 'slēv ˌvalv }

slenderness ratio [CIV ENG] The ratio of the length of a column L to the radius of gyration *r* about the principal axes of the section. { 'slen·dər·nəs ˌrā·shō }

slewing [ENG] Moving a radar antenna or a sonar transducer rapidly in a horizontal or vertical direction, or both. { 'slü·iŋ }

slewing mechanism [ENG] Device which permits rapid traverse or change in elevation of a weapon or instrument. { 'slü·iŋ ˌmek·əˌniz·əm }

slew rate [CONT SYS] The maximum rate at which a system can follow a command. [ELECTR] The maximum rate at which the output voltage of an operational amplifier changes for a square-wave or step-signal input; usually specified in volts per microsecond. { 'slü ˌrāt }

slice bar [ENG] A broad, flat steel blade used for chipping and scraping. { 'slīs ˌbär }

slide [ENG] **1.** A sloping chute with a flat bed. **2.** A sliding mechanism. [MECH ENG] The main reciprocating member of a mechanical press, guided in a press frame, to which the punch or upper die is fastened. { slīd }

slide conveyor [ENG] A slanted gravity slide for the forward downward movement of flowable solids, slurries, liquids, or small objects. { 'slīd kənˌvā·ər }

slide gate [CIV ENG] A crest gate which has high frictional resistance to opening because it slides on its bearings in opening and closing. { 'slīd ˌgāt }

slide projector *See* optical lantern. { 'slīd prəˌjek·tər }

slider [ELEC] Sliding type of movable contact. { 'slīd·ər }

slide rail *See* guardrail. { 'slīd ˌrāl }

slider coupling [MECH ENG] A device for connecting shafts that are laterally misaligned. Also known as double-slider coupling; Oldham coupling. { 'slīd·ər ˌkəp·liŋ }

slide rest [MECH ENG] An adjustable slide for holding a cutting tool, as on an engine lathe. { 'slīd ˌrest }

slider support [ENG] A support designed to allow longitudinal movement of pipework in a horizontal plane. { 'slīd·ər sə'pȯrt }

slide-rule dial [ENG] A dial in which a pointer moves in a straight line over long straight scales resembling the scales of a slide rule. { 'slīd ˌrül ˌdīl }

slide valve [MECH ENG] A sliding mechanism to cover and uncover ports for the admission of fluid, as in some steam engines. { 'slīd ˌvalv }

sliding-block linkage [MECH ENG] A mechanism in which a crank and sliding block serve to convert rotary motion into translation, or vice versa. { 'slīd·iŋ ˌbläk 'liŋ·kij }

sliding-chain conveyor [MECH ENG] A conveying machine to handle cases, cans, pipes, or similar products on the plain or modified links of a set of parallel chains. { 'slīd·iŋ ˌchān kən'vā·ər }

sliding fit [DES ENG] A fit between two parts that slide together. { 'slīd·iŋ 'fit }

sliding form *See* slip form. { 'slīd·iŋ ˌfȯrm }

sliding friction [MECH] Rubbing of bodies in sliding contact. { 'slīd·iŋ ˌfrik·shən }

sliding gear [DES ENG] A change gear in which speed changes are made by sliding gears along their axes, so as to place them in or out of mesh. { 'slīd·iŋ ˌgir }

sliding-gear transmission [MECH ENG] A transmission system utilizing a pair of sliding gears. { 'slīd·iŋ ˌgir tranz'mish·ən }

sliding pair [MECH ENG] Two adjacent links, one of which is constrained to move in a particular path with respect to the other; the lower, or closed, pair is completely constrained by the design of the links of the pair. { 'slīd·iŋ 'per }

sliding-vane compressor [CHEM ENG] A rotary-element gas compressor in which spring-loaded sliding vanes (evenly spaced around a cylinder off-center in a surrounding chamber) pick up, compress, and discharge gas as the cylinder revolves. { 'slīd·iŋ ˌvān kəm'pres·ər }

sliding vector [MECH] A vector whose direction and line of application are prescribed, but whose point of application is not prescribed. { 'slīd·iŋ 'vek·tər }

sliding way [CIV ENG] One of the timbers which form the upper part of the cradle supporting a ship during its construction, and which slide over the ground ways with the ship when it is launched. { 'slīd·iŋ 'wā }

slime [ENG] Liquid slurry of very fine solids with slime- or mudlike appearance. Also known as mud; pulp; sludge. { slīm }

slim hole [ENG] A drill hole of the smallest practicable size, drilled with less-than normal-diameter tools, used primarily as a seismic shothole and for structure tests and sometimes for stratigraphic tests. { 'slīm ˌhōl }

sling [ENG] A length of rope, wire rope, or chain used for attaching a load to a crane hook. { sliŋ }

sling psychrometer [ENG] A psychrometer in which the wet- and dry-bulb thermometers are mounted upon a frame connected to a handle at one end by means of a bearing or a length of chain; the psychrometer may be whirled in the air for the simultaneous measurement of wet- and dry-bulb temperatures. { 'sliŋ si'kräm·əd·ər }

sling thermometer [ENG] A thermometer mounted upon a frame connected to a handle at one end by means of a bearing or length of chain, so that the thermometer may be whirled by hand. { 'sliŋ thər'mäm·əd·ər }

slip [CIV ENG] A narrow body of water between two piers. [ELEC] **1.** The difference between synchronous and operating speeds of an induction machine. Also known as slip speed. **2.** Method of interconnecting multiple wiring between switching units by which trunk number 1 becomes the first choice for the first switch, trunk number 2 first choice for the second switch, trunk number 3 first choice for the third switch, and so on. [ELECTR] Distortion produced in the recorded facsimile image which is similar to that produced by skew but is caused by slippage in the mechanical drive system. { slip }

slip casting [ENG] A process in the manufacture of shaped refractories, cermets, and other materials in which the slip is poured into porous plaster molds. { 'slip ˌkast·iŋ }

slip form [CIV ENG] A narrow section of formwork that can be easily removed as concrete placing progresses. { 'slip ˌfȯrm }

slip forming [ENG] A plastics-sheet forming technique in which some of the sheet is allowed to slip through the mechanically operated clamping rings during stretch-forming operations. { 'slip ˌfȯrm·iŋ }

slip friction clutch [MECH ENG] A friction clutch designed to slip when too much power is applied to it. { 'slip 'frik·shən ˌkləch }

slip joint [CIV ENG] **1.** Contraction joint between two adjoining wall sections, or at the horizontal bearing of beams, slabs, or precast units, consisting of a vertical tongue fitted into a groove which allows independent movement of the two sections. **2.** A telescoping joint between two parts. [ENG] **1.** A method of laying-up plastic veneers in flexible-bag molding, wherein edges are beveled and allowed to overlap part or all of the scarfed area. **2.** A mechanical union that allows limited endwise movement of two solid items for example, pipe, rod, or duct with relation to each other. { 'slip ˌjȯint }

slippage [ENG] The leakage of fluid between the plunger and the bore of a pump piston. Also known as slippage loss. { 'slip·ij }

slippage loss [ENG] **1.** Unintentional movement between the faces of two solid objects. **2.** *See* slippage. { 'slip·ij ˌlȯs }

slipper brake [MECH ENG] **1.** A plate placed against a moving part to slow or stop it. **2.** A plate applied to the wheel of a vehicle or to the track roadway to slow or stop the vehicle. { 'slip·ər ˌbrāk }

slip plane [ENG] A plane visible by reflected light in a transparent material; caused by poor welding and shrinkage during cooling. { 'slip ˌplān }

slip ratio [MECH ENG] For a screw propeller, relates the actual advance to the theoretic advance determined by pitch and spin. { 'slip ˌrā·shō }

slips [ENG] A wedge-shaped steel collar fabricated in two sections, designed to hold a string of casing between various portions of the drilling operation. { 'slips }

slip speed *See* slip. { 'slip ˌspēd }

slip tongue [ENG] A pole on a horse-drawn wagon that is fastened by slipping it between two plates connected to the forecarriage. { 'slip ˌtəŋ }

slipway [CIV ENG] The space in a shipyard where a foundation for launching ways and keel blocks exists and which is occupied by a ship while under construction. { 'slipˌwā }

slit [DES ENG] A long, narrow opening through which radiation or streams of particles enter or leave certain instruments. { slit }

slitter [MECH ENG] A synchronized feeder-knife variation of a rotary cutter; used for precision cutting of sheet material, such as metal, rubber, plastics, or paper, into strips. { 'slid·ər }

slitting [MECH ENG] The passing of sheet or strip material (metal, plastic, paper, or cloth) through rotary knives. { 'slid·iŋ }

slop [CHEM ENG] A petroleum-refinery term for odds and ends of oil produced in the refinery; the slop must be rerun or further processed to make it suitable for use. Also known as slop oil. { släp }

slope conveyor [MECH ENG] A troughed belt conveyor used for transporting material on steep grades. { 'slōp kənˌvā·ər }

slope course [ENG] A proving ground facility consisting of a large mound of earth with various sloping sides on which are roads having different grades; this slope course is used to measure the slope performance of military and other vehicles, including maximum speed on various grades, the most suitable gear for best performance, traction, and the holding ability of brakes. { 'slōp ˌkȯrs }

slope of fall [MECH] Ratio between the drop of a projectile and its horizontal movement; tangent of the angle of fall. { 'slōp əv 'fȯl }

slop oil *See* slop. { 'släp ˌȯil }

slosh test [ENG] A test to determine the ability of the control system of a liquid-propelled missile to withstand or overcome the dynamic movement of the liquid within its fuel tanks. { 'släsh ˌtest }

slot [DES ENG] A narrow, vertical opening. [ELEC] One of the conductor-holding grooves in the face of the rotor or stator of an electric rotating machine. { slät }

slot distributor [ENG] A long, narrow discharge opening (slot) in a pipe or conduit; used for the extrusion of sheet material, such as plastics. { 'slät di'strib·yəd·ər }

slot dozing [ENG] A method of moving large quantities of material with a bulldozer using the same path for each trip so that the spillage from the sides of the blade builds up along each side; afterward all material pushed into the slot is retained in front of the blade. { 'slät ˌdōz·iŋ }

slot extrusion [ENG] A method of extruding plastics-film sheet in which the molten thermoplastic compound is forced through a straight slot. { 'slät ik'strü·zhən }

slotted-head screw [DES ENG] A screw fastener with a single groove across the diameter of the head. { 'släd·əd ˌhed 'skrü }

slotted nut [DES ENG] A regular hexagon nut with slots cut across the flats of the hexagon so that a cotter pin or safety wire can hold it in place. { 'släd·əd 'nət }

slotter [MECH ENG] A machine tool used for making a mortise or shaping the sides of an aperture. { 'släd·ər }

slotting [MECH ENG] Cutting a mortise or a similar narrow aperture in a material using a machine with a vertically reciprocating tool. { 'släd·iŋ }

slotting machine [MECH ENG] A vertically reciprocating planing machine, used for making mortises and for shaping the sides of openings. { 'släd·iŋ məˌshēn }

slot washer [DES ENG] **1.** A lock washer with an indentation on its edge through which a nail or screw can be driven to hold it in place. **2.** A

washer with a slot extending from its edge to the center hole to allow the washer to be removed without first removing the bolt. { 'slät ˌwäsh·ər }

slough [ENG] The fragments of rocky material from the wall of a borehole. Also known as cavings. { slaù }

slow igniter cord [ENG] An igniter cord made with a central copper wire around which is extruded a plastic incendiary material with an iron wire embedded to give greater strength; the whole is enclosed in a thin extruded plastic coating. { 'slō ig'nīd·ər ˌkȯrd }

slow match [ENG] A match or fuse that burns at a known slow rate; used for igniting explosive charges. { 'slō 'mach }

slow sand filter [CIV ENG] A bed of fine sand 20–48 inches (151–122 centimeters) deep through which water, being made suitable for human consumption and other purposes, is passed at a fairly low rate, 2,500,000 to 10,000,000 gallons per acre (23,000 to 94,000 cubic meters per hectare); an underdrain system of graded gravel and perforated pipes carries the water from the filters to the point of discharge. { 'slō 'sand ˌfil·tər }

slow-spiral drill *See* low-helix drill. { 'slō ¦spī·rəl 'dril }

sludge [CHEM ENG] **1.** Residue left after acid treatment of petroleum oils. **2.** Any semisolid waste from a chemical process. [CIV ENG] *See* sewage sludge. [ENG] **1.** Mud from a drill hole in boring. **2.** Sediment in a steam boiler. **3.** A precipitate from petroleum oils or liquid fuels, for example, the insoluble degradation products formed during the operation of an internal combustion engine. **4.** An amorphous deposit that has accumulated on the surface of a tube in a heat exchanger or of an evaporating device, but is not bonded to the fouled surface. **5.** *See* slime. { sləj }

sludge bucket *See* calyx. { 'sləj ˌbək·ət }

sludge coking [CHEM ENG] The recovery of sulfuric acid from dry acid sludge. { 'sləj ˌkōk·iŋ }

sludge pit *See* slushpit. { 'sləj ˌpit }

sludge pond *See* slushpit. { 'sləj ˌpänd }

sludge pump *See* sand pump. { 'sləj ˌpəmp }

sluff [ENG] The mud cake detached from the wall of a borehole. { sləf }

slug [MECH] A unit of mass in the British gravitational system of units, equal to the mass which experiences an acceleration of 1 foot per second per second when a force of 1 pound acts on it; equal to approximately 32.1740 pound mass or 14.5939 kilograms. Also known as geepound. { sləg }

slug bit *See* insert bit. { 'sləg ˌbit }

sluice [CIV ENG] **1.** A passage fitted with a vertical sliding gate or valve to regulate the flow of water in a channel or lock. **2.** A body of water retained by a floodgate. **3.** A channel serving to drain surplus water. { 'slüs }

sluice gate [CIV ENG] The vertical slide gate of a sluice. { 'slüs ˌgāt }

sluicing pond *See* scouring basin. { 'slüs·iŋ ˌpänd }

slump test [ENG] Determining the consistency of concrete by filling a conical mold with a sample of concrete, then inverting it over a flat plate and removing the mold; the amount by which the concrete drops below the mold height is measured and this represents the slump. { 'sləmp ˌtest }

slurry bed reactor *See* ebullating-bed reactor. { 'slər·ē ˌbed rēˌak·tər }

slurrying [ENG] The formation of a mud or a suspension from a liquid and nonsoluble solid particles. { 'slər·ē·iŋ }

slurry preforming [ENG] The preparation of reinforced plastics preforms by wet-processing techniques; similar to pulp molding. { 'slər·ē prē'fȯrm·iŋ }

slurry truck [ENG] A mobile unit that transports dry blasting ingredients, and mixes them in required proportions for introduction as explosive slurry into blastholes. { 'slər·ē ˌtrək }

slusher [ENG] A method for the application of vitreous enamel slip to ware by dashing it on the ware to cover all its parts, excess then being removed by shaking the ware. { 'sləsh·ər }

slush grouting [CIV ENG] Spreading a portland cement slurry over a surface that will subsequently be covered by concrete. { 'sləsh ˌgraùd·iŋ }

slush molding [ENG] A thermoplastic casting in which a liquid resin is poured into a hot, hollow mold where a viscous skin forms; excess slush is drained off, the mold is cooled, and the molded product is stripped out. { 'sləsh ˌmōld·iŋ }

slushpit [ENG] An excavation or diked area to hold water, mud, sludge, and other discharged matter from an oil well. Also known as mud pit; sludge pit; sludge pond. { 'shəsh,pit }

small calorie *See* calorie. { 'smȯl 'kal·ə·rē }

small-diameter blasthole [ENG] A blast hole $1\frac{1}{2}$ to 3 inches (3.8 to 7.6 centimeters) in diameter, in low-face quarries. { 'smȯl dī¦am·əd·ər 'blast,hōl }

small-lot storage [IND ENG] Generally, a quantity of less than one pallet stack, stacked to maximum storage height; thus, the term refers to a lot consisting of from one container to two or more pallet loads, but is not of sufficient quantity to form a complete pallet column. { 'smȯl ¦lät 'stȯr·ij }

small-scale hydropower [MECH ENG] The generation of electricity by using hydraulic turbines in which the installed capacity of the plant lies within the range from 5 kilowatts to 5 megawatts. { 'smȯl ˌskāl 'hī·drəˌpaü·ər }

smart sensor [ENG] A microsensor integrated with signal-conditioning electronics such as analog-to-digital converters on a single silicon chip to form an integrated microelectromechanical component that can process information itself or communicate with an embedded microprocessor. Also known as intelligent sensor. { ˌsmärt 'sen·sər }

smart structures [ENG] Structures that are capable of sensing and reacting to their environment in a predictable and desired manner, through the integration of various elements, such as sensors, actuators, power sources, signal processors, and communications network. In addition to carrying mechanical loads, smart structures may alleviate vibration, reduce acoustic noise, monitor their own condition and environment, automatically perform precision alignments, or change their shape or mechanical properties on command. { ˌsmärt 'strək·chərz }

smart tool [CONT SYS] A robot end effector or fixed tool that uses sensors to measure the tool's position relative to reference markers or a workpiece or jig, and an actuator to adjust the tool's position with respect to the workpiece. { 'smärt ˌtül }

Smithell's burner [ENG] Two concentric tubes that can be added to a bunsen burner to separate the inner and outer flame cones. { 'smith·əlz ˌbər·nər }

Smith-McIntyre sampler [MECH ENG] A device for taking samples of sediment from the ocean bottom; the digging and hoisting mechanisms are independent: the digging bucket is forced into the sediment before the hoisting action occurs. { 'smith 'mak·ən,tīr ˌsam·plər }

smoke [ENG] Dispersions of finely divided (0.01–5.0 micrometers) solids or liquids in a gaseous medium. { smōk }

smokebox [MECH ENG] A chamber external to a boiler for trapping the unburned products of combustion. { 'smōk,bäks }

smoke chamber [ENG] That area in a fireplace directly above the smoke shelf. { 'smōk ˌchām·bər }

smoke detector [ENG] A photoelectric system for an alarm when smoke in a chimney or other location exceeds a predetermined density. { 'smōk di,tek·tər }

smoke point [ENG] The maximum flame height in millimeters at which kerosine will burn without smoking, tested under standard conditions; used as a measure of the burning cleanliness of jet fuel and kerosine. { 'smōk ˌpȯint }

smoke shelf [ENG] A horizontal surface directly behind the throat of a fireplace to prevent downdrafts. { 'smōk ˌshelf }

smokestack [ENG] A chimney for the discharge of flue gases from a furnace operation such as in a steam boiler, powerhouse, heating plant, ship, locomotive, or foundry. { 'smōk,stak }

smoke test [ENG] A test used on kerosine to determine the highest point to which the flame can be turned before smoking occurs. { 'smōk ˌtest }

smoke washer [ENG] A device for removing particles from smoke by forcing it through a spray of water. { 'smōk ˌwäsh·ər }

smooth blasting [ENG] Blasting to ensure even faces without cracks in the rock. { 'smüth 'blast·iŋ }

smooth drilling [ENG] Drilling in a rock formation in which a fast rotation of the drill stem, a fast rate of penetration, and a high recovery of core can be achieved with vibration-free rotation of the drill stem. { 'smüth 'dril·iŋ }

smoothing [ENG] Making a level, or continuously even, surface. { 'smüth·iŋ }

smoothing mill [MECH ENG] A revolving stone wheel used to cut and bevel glass or stone. { 'smüth·iŋ ˌmil }

smoothing plane [DES ENG] A finely set hand tool, usually 5.5–10 inches (14–25.4 centimeters) long, for finishing small areas on wood. { 'smüth·iŋ ˌplān }

smother kiln [ENG] A kiln into which smoke can be introduced for blackening pottery. { 'sməth·ər ˌkil }

smudging [ENG] A frost-preventive measure used in orchards; properly, it means the production of heavy smoke, supposed to prevent radiational cooling, but it is generally applied to both heating and smoke production. { 'smәj·iŋ }

S/N *See* signal-to-noise ratio.

snagging [MECH ENG] Removing surplus metal or large surface defects by using a grinding wheel. { 'snag·iŋ }

snake hole [ENG] **1.** A blasting hole bored directly under a boulder. **2.** A drill hole used in quarrying or bench blasting. { 'snāk ˌhōl }

snaking [ENG] Towing a load with a long cable. { 'snāk·iŋ }

snap-back forming [ENG] A plastic-sheet-forming technique in which an extended, heated, plastic sheet is allowed to contract over a form shaped to the desired final contour. { 'snap ˌbak ˌfȯrm·iŋ }

snapback method *See* repetitive time method. { 'snap,bak ˌmeth·əd }

snap fastener [DES ENG] A fastener consisting of a ball on one edge of an article that fits in a socket on an opposed edge, and used to hold edges together, such as those of a garment. { 'snap ˌfas·ən·ər }

snap gage [DES ENG] A device with two flat, parallel surfaces spaced to control one limit of tolerance of an outside diameter or a length. { 'snap ˌgāj }

snap hook *See* spring hook. { 'snap ˌhük }

snap-off diode [ELECTR] Planar epitaxial passivated silicon diode that is processed so a charge is stored close to the junction when the diode is conducting; when reverse voltage is applied, the stored charge then forces the diode to snap off or switch rapidly to its blocking state. { 'snap,ȯf 'dī,ōd }

snapper [ENG] A device for collecting samples from the ocean bottom, and which closes to prevent the sample from dropping out as it is raised to the surface. { 'snap·ər }

snap ring [DES ENG] A form of spring used as a fastener; the ring is elastically deformed, put in place, and allowed to snap back toward its unstressed position into a groove or recess. { 'snap ˌriŋ }

snatch block [DES ENG] A pulley frame or sheave with an eye through which lashing can

be passed to fasten it to a scaffold or pole. { 'snach ˌbläk }

snatch plate [ENG] A thick steel plate through which a hole about one-sixteenth of an inch larger than the outside diameter of the drill rod on which it is to be used is drilled; the plate is slipped over the drill rod and one edge is fastened to a securely anchored chain, and if rods must be pulled because high-pressure water is encountered, the eccentric pull of the chain causes the outside of the rods to be gripped and held against the pressure of water; the rod is moved a short distance out of the hole each time the plate is tapped. { 'snach ˌplāt }

S-N diagram [ENG] In fatigue testing, a graphic representation of the relationship of stress S and the number of cycles N before failure of the material. { ¦es¦en 'dī·əˌgram }

snifter valve [ENG] A valve on a pump that allows air to enter or escape, and accumulated water to be released. { 'snif·tər ˌvalv }

snorkel [ENG] Any tube which supplies air for an underwater operation, whether it be for material or personnel. { 'snȯr·kəl }

snow bin [ENG] A box for measuring the amount of snowfall; a type of snow gage. { 'snō ˌbin }

snow blower [MECH ENG] A machine that removes snow from a road surface or pavement using a screw-type blade to push the snow into the machine and from which it is ejected at some distance. { 'snō ˌblō·ər }

snowbreak [CIV ENG] Any barrier designed to shelter an object or area from snow. { 'snōˌbrāk }

snow fence [CIV ENG] An open-slatted board fence usually 4 to 10 feet (1.2 to 3.0 meters) high, placed about 50 feet (15 meters) on the windward side of a railroad track or highway; the fence serves to disrupt the flow of the wind so that the snow is deposited close to the fence on the leeward side, leaving a comparatively clear, protected strip parallel to the fence and slightly farther downwind. { 'snō ˌfens }

snow load [CIV ENG] The unit weight factor considered in the design of a flat or pitched roof for the probable amount of snow lying upon it. { 'snō ˌlōd }

snow mat [ENG] A device used to mark the surface between old and new snow, consisting of a piece of white duck 28 inches (71 centimeters) square, having in each corner triangular pockets in which are inserted slats placed diagonally to keep the mat taut and flat. { 'snō ˌmat }

snow-melting system [CIV ENG] A system of pipes containing a circulating nonfreezing liquid or electric-heating cables, embedded beneath the surface of a road, walkway, or other area to be protected from snow accumulation. { 'snō ˌmelt·iŋ ˌsis·təm }

snow pillow [ENG] A device used to record the changing weight of the snow cover at a point, consisting of a fluid-filled bladder lying on the ground with a pressure transducer or a vertical pipe and float connected to it. { 'snō ˌpil·ō }

snowplow [MECH ENG] A device for clearing away snow, as from a road or railway track. { 'snōˌplaù }

snow resistograph [ENG] An instrument for recording a hardness profile of a snow cover by recording the force required to move a blade up through the snow. { 'snō ri'zis·təˌgraf }

snow sampler [ENG] A hollow tube for collecting a sample of snow in place. Also known as snow tube. { 'snō ˌsam·plər }

snow scale *See* snow stake. { 'snō ˌskāl }

snowshed [CIV ENG] A structure to protect an exposed area as a road or rail line from snow. { 'snōˌshed }

snow stake [ENG] A wood scale, calibrated in inches, used in regions of deep snow to measure its depth; it is bolted to a wood post or angle iron set in the ground. Also known as snow scale. { 'snō ˌstāk }

snow tube *See* snow sampler. { 'snō ˌtüb }

SNR *See* signal-to-noise ratio.

snubber [MECH ENG] A mechanical device consisting essentially of a drum, spring, and friction band, connected between axle and frame, in order to slow the recoil of the spring and reduce jolting. { 'snəb·ər }

Snyder sampler [ENG] A mechanical device for obtaining small representative quantities from a moving stream of pulverized or granulated solids; it consists of a cast-iron plate revolving in a vertical plane on a horizontal axis with an inclined sample spout; the material to be sampled comes to the sampler by way of an inclined chute whenever the sample spout comes in line with the moving stream. { 'snī·dər 'sam·plər }

soaking drum [CHEM ENG] A heated petroleum-refinery process vessel used in connection with petroleum thermal-cracking coils to furnish the residence time needed to complete the cracking reaction. { 'sōk·iŋ ˌdrəm }

soap bubble test [ENG] A leak test in which a soap solution is applied to the surface of the vessel under internal pressure test; soap bubbles form if the tracer gas leaks from the vessel. { 'sōp ¦bəb·əl ˌtest }

socket [ELEC] A device designed to provide electric connections and mechanical support for an electronic or electric component requiring convenient replacement. [ENG] A device designed to receive and grip the end of a tubular object, such as a tool or pipe. { 'säk·ət }

socket-head screw [DES ENG] A screw fastener with a geometric recess in the head into which an appropriate wrench is inserted for driving and turning, with consequent improved nontamperability. { 'säk·ət ¦hed ˌskrü }

socket wrench [DES ENG] A wrench with a socket to fit the head of a bolt or a nut. { 'säk·ət ˌrench }

soda-acid extinguisher [ENG] A fire-extinguisher from which water is expelled at a high rate by the generation of carbon dioxide, the result of mixing (when the extinguisher is tilted) of sulfuric acid and sodium bicarbonate. { 'sōd·ə 'as·əd ik'stiŋ·gwə·shər }

soda pulping process [CHEM ENG] The digestion of wood chips by caustic soda; used to manufacture pulp for paper products. { 'sōd·ə 'pəl·piŋ ˌprä·səs }

sodar [ENG] Sound-wave transmitting and receiving equipment that is used to remotely measure the vertical turbulence structure and wind profile of the lower layer of the atmosphere by analyzing sound reflected in scattering by atmospheric turbulence. Derived from sonic detection and ranging. { 'sōˌdär }

sodium sulfite process [CHEM ENG] A process for the digestion of wood chips in a solution of magnesium, ammonium, or calcium disulfite containing free sulfur dioxide; used in papermaking. { 'sōd·ē·əm 'səlˌfīt ˌprä·səs }

soffit [CIV ENG] The underside of a horizontal structural member, such as a beam or a slab. { 'säf·ət }

soft automation [ENG] Automatic control, chiefly through the use of computer processing, with relatively little reliance on computer hardware. { 'sȯft ˌȯd·ə'mā·shən }

soft flow [ENG] The free-flowing characteristics of a plastic material under conventional molding conditions. { 'sȯft 'flō }

soft hammer [ENG] A hammer having a head made of a soft material, such as copper, lead, rawhide, or plastic; used to prevent damage to a finished surface. { 'sȯft 'ham·ər }

soft-iron ammeter [ENG] An ammeter in which current in a coil causes two pieces of magnetic material within the coil, one fixed and one attached to a pointer, to become similarly magnetized and to repel each other, moving the pointer; used for alternating-current measurement. { 'sȯft ˌī·ərn 'amˌēd·ər }

soft missile base [CIV ENG] A missile-launching base that is not protected against a nuclear explosion. { 'sȯft 'mis·əl ˌbās }

soft patch [ENG] A patch in a crack in a vessel such as a steam boiler consisting of a soft material inserted in the crack and covered by a metal plate bolted or riveted to the vessel. { 'sȯft 'pach }

soft-wired numerical control *See* computer numerical control. { 'sȯf ˌwīrd nü'mer·ə·kəl kən'trōl }

soil line *See* soil pipe. { 'sȯil ˌlīn }

soil mechanics [ENG] The application of the laws of solid and fluid mechanics to soils and similar granular materials as a basis for design, construction, and maintenance of stable foundations and earth structures. { 'sȯil miˌkan·iks }

soil pipe [CIV ENG] A cast-iron or plastic pipe for carrying discharges from toilet fixtures from a building into the soil drain. Also known as soil line. { 'sȯil ˌpīp }

soil stack [BUILD] The main vertical pipe into which flows the waste water from the soil pipes in a structure. { 'sȯil ˌstak }

soil thermograph [ENG] A remote-recording thermograph whose sensing element may be buried at various depths in the earth. { 'sȯil 'thər·məˌgraf }

soil thermometer [ENG] A thermometer used to measure the temperature of the soil, usually the mercury-in-glass thermometer. Also known as earth thermometer. { 'sȯil thərˌmäm·əd·ər }

soil vent *See* stack vent. { 'sȯil ˌvent }

solar attachment [ENG] A device for determining the true meridian directly from the sun; used an an attachment on a surveyor's transit or compass. { 'sō·lər ə'tach·mənt }

solar battery [ELECTR] An array of solar cells, usually connected in parallel and series. { 'sō·lər 'bad·ə·rē }

solar cell [ELECTR] A *pn*-junction device which converts the radiant energy of sunlight directly and efficiently into electrical energy. { 'sō·lər 'sel }

solar chimney [ENG] A natural-draft drive device that uses solar radiation to provide upward momentum to a mass of air, thereby converting the thermal energy to kinetic energy, which can be extracted from the air with suitable wind machines. { ˌsō·lər 'chim·nē }

solar collector [ENG] An installation designed to gather and accumulate energy in the form of solar radiation. { 'sō·lər kə'lek·tər }

solar distillation [CHEM ENG] A procedure in which the sun's heat is used to evaporate seawater in order to produce sodium chloride and other salts or potable water. { 'sō·lər ˌdis·tə'lā·shən }

solar engine [MECH ENG] An engine which converts thermal energy from the sun into electrical, mechanical, or refrigeration energy; may be used as a method of spacecraft propulsion, either directly by photon pressure on huge solar sails, or indirectly from solar cells or from a reflector-boiler combination used to heat a fluid. { 'sō·lər 'en·jən }

solar furnace [ENG] An image furnace in which high temperatures are produced by focusing solar radiation. { 'sō·lər 'fər·nəs }

solar heating [MECH ENG] The conversion of solar radiation into heat for technological, comfort-heating, and cooking purposes. { 'sō·lər 'hēd·iŋ }

solar heat storage [ENG] The storage of solar energy for later use; usually accomplished by the heating of water or fusing a salt, although sand and gravel have been used as storage media. { 'sō·lər 'hēt ˌstȯr·ij }

solar house [BUILD] A house with large expanses of glass designed to catch solar radiation for heating. { 'sō·lər ˌhaus }

solarimeter [ENG] **1.** A type of pyranometer consisting of a Moll thermopile shielded from the wind by a bell glass. **2.** *See* pyranometer. { ˌsō·lə'rim·əd·ər }

solar magnetograph [ENG] An instrument that utilizes the Zeeman effect to directly measure the strength and polarity of the complex patterns of magnetic fields at the sun's surface; comprises a telescope, a differential analyzer, a spectrograph, and a photoelectric or photographic means of differencing and recording. { 'sō·lər mag'ned·əˌgraf }

solar pond [MECH ENG] A type of nonfocusing

solar collector consisting of a pool of salt water heated by the sun; used either directly as a source of heat or as a power source for an electric generator. Also known as salt-gradient solar pond. { 'sō·lər 'pänd }

solar power [MECH ENG] The conversion of the energy of the sun's radiation to useful work. { 'sō·lər 'paù·ər }

solar power satellite [ENG] A proposed collector of solar energy that would be placed in geostationary orbit where sunlight striking the satellite would be converted to electricity and then to microwaves, which would be beamed to earth. { ˌsō·lər ˌpaù·ər 'sad·əlˌīt }

solar sensor [ELECTR] A light-sensitive diode that sends a signal to the attitude-control system of a spacecraft when it senses the sun. Also known as sun sensor. { 'sō·lər 'sen·sər }

solar still [CHEM ENG] A device for evaporating seawater, in which water is confined in one or more shallow pools, over which is placed a roof-shaped transparent cover made of glass or plastic film; the sun's heat evaporates the water, leaving behind a residue of salt; the vapor from the evaporated water condenses on the surface of the cover and trickles down into gutters, which thus collect fresh water. { 'sō·lər 'stil }

solder-ball flip chip *See* flip chip. { ¦säd·ər ˌbȯl 'flip ˌchip }

soldering gun [ENG] A soldering iron shaped like a gun. { 'säd·ə·riŋ ˌgən }

soldering iron [ENG] A rod of copper with a handle on one end and pointed or wedge-shaped at the other end, and used for applying heat in soldering. { 'säd·ə·riŋ ˌī·ərn }

soldering pencil [ENG] A small soldering iron, about the size and weight of a standard lead pencil, used for soldering or unsoldering joints on printed wiring boards. { 'säd·ə·riŋ ˌpen·səl }

solder track [ELECTR] A conducting path on a printed circuit board that is formed by applying molten solder to the board. { 'säd·ər ˌtrak }

soldier course [CIV ENG] A course of bricks laid on their ends so that only their long sides are visible. { 'sōl·jər ˌkȯrs }

sole [BUILD] The horizontal member beneath the studs in a framed building. [ELECTR] Electrode used in magnetrons and backward-wave oscillators to carry a current that generates a magnetic field in the direction wanted. { sōl }

solenoid brake [MECH ENG] A device that retards or arrests rotational motion by means of the magnetic resistance of a solenoid. { 'säl·əˌnȯid ˌbrāk }

solenoid valve [MECH ENG] A valve actuated by a solenoid, for controlling the flow of gases or liquids in pipes. { 'säl·əˌnȯid ˌvalv }

solepiece [CIV ENG] One of two steel plates, port and starboard, whose forward parts are bolted to the ground ways supporting a ship about to be launched, while their aft parts are attached to the sliding ways; at the start of the launch, they are cut simultaneously with burning torches to release the ship. Also known as soleplate. { 'sōlˌpēs }

soleplate [BUILD] The plate on which stud bases butt in a stud partition. [CIV ENG] *See* solepiece. [ENG] **1.** The supporting base of a machine. **2.** A plate on which a bearing can be attached and, if necessary, adjusted slightly. { 'sōlˌplāt }

solid box [MECH ENG] A solid, unadjustable ring bearing lined with babbitt metal, used on light machinery. { 'säl·əd 'bäks }

solid coupling [MECH ENG] A flanged-face or a compression-type coupling used to connect two shafts to make a permanent joint and usually designed to be capable of transmitting the full load capacity of the shaft; a solid coupling has no flexibility. { 'säl·əd 'kəp·liŋ }

solid cutter [DES ENG] A cutter made of a single piece of material. { 'säl·əd 'kəd·ər }

solid die [DES ENG] A one-piece screw-cutting tool with internal threads. { 'säl·əd 'dī }

solid drilling [ENG] In diamond drilling, using a bit that grinds the whole face, without preserving a core for sampling. { 'säl·əd 'dril·iŋ }

solid-electrolyte gas transducer [ENG] A device in which the concentration of a particular gas in a mixture is determined from the diffusion voltage across a heated solid electrolyte placed between this mixture and a reference gas. { 'säl·əd i'lek·trəˌlīt 'gas tranzˌdüs·ər }

solid injection system [MECH ENG] A fuel injection system for a diesel engine in which a pump forces fuel through a fuel line and an atomizing nozzle into the combustion chamber. { 'säl·əd in'jek·shən ˌsis·təm }

solid logic technology [ELECTR] A method of computer construction that makes use of miniaturized modules, resulting in faster circuitry because of the reduced distances that current must travel. { 'säl·əd ¦läj·ik tek'näl·ə·jē }

solid shafting [MECH ENG] A solid round bar that supports a roller and wheel of a machine. { 'säl·əd 'shaft·iŋ }

solid shank tool [ENG] A cutting tool in which the shank and cutting edges are machined from one piece. { 'säl·əd ¦shaŋk 'tül }

solid state [ENG] Pertaining to a circuit, device, or system that depends on some combination of electrical, magnetic, and optical phenomena within a solid that is usually a crystalline semiconductor material. { 'säl·əd 'stāt }

solid-state circuit [ELECTR] Complete circuit formed from a single block of semiconductor material. { 'säl·əd ¦stāt 'sər·kət }

solid-state circuit breaker [ELECTR] A circuit breaker in which a Zener diode, silicon controlled rectifier, or solid-state device is connected to sense when load terminal voltage exceeds a safe value. { 'säl·əd ¦stāt 'sər·kət ˌbrāk·ər }

solid-state component [ELECTR] A component whose operation depends on the control of electrical or magnetic phenomena in solids, such as a transistor, crystal diode, or ferrite device. { 'säl·əd ¦stāt kəm'pō·nənt }

solid-state device [ELECTR] A device, other than a conductor, which uses magnetic, electri-

cal, and other properties of solid materials, as opposed to vacuum or gaseous devices. { 'säl·əd ¦stāt di'vīs }

solid-state image sensor *See* charge-coupled image sensor. { 'säl·əd ¦stāt 'im·ij ˌsen·sər }

solid-state lamp *See* light-emitting diode. { 'säl·əd ¦stāt 'lamp }

solid-state power amplifier [ELECTR] An amplifier that uses field-effect transistors to provide useful amplification at gigahertz frequencies. { ˌsäl·əd ˌstāt 'paù·ər ˌam·pləˌfī·ər }

solid-state relay [ELECTR] A relay that uses only solid-state components, with no moving parts. Abbreviated SSR. { 'säl·əd ¦stāt 'rē,lā }

solid-state switch [ELECTR] A microwave switch in which a semiconductor material serves as the switching element; a zero or negative potential applied to the control electrode will reverse-bias the switch and turn it off, and a slight positive voltage will turn it on. { 'säl·əd ¦stāt 'swich }

solid-state thyratron [ELECTR] A semiconductor device, such as a silicon controlled rectifier, that approximates the extremely fast switching speed and power-handling capability of a gaseous thyratron tube. { 'säl·əd ¦stāt 'thī·rəˌträn }

solid-web girder [CIV ENG] A beam, such as a box girder, having a web consisting of a plate or other solid section but not a lattice. { 'säl·əd ¦web 'gər·dər }

solution polymerization [CHEM ENG] A process for producing an addition polymer by heating the monomer, solvent, initiator, and catalyst together, with polymerization continuing as the solvent is removed. { səˌlü·shən pəˌlim·ə·rə 'zā·shən }

solution process [CHEM ENG] An oil-refining process for separating mercaptans from gasoline by washing with a caustic solution containing organic compounds in which the mercaptans are soluble. { sə'lü·shən ˌprä·səs }

solutizer-air regenerative process [CHEM ENG] A petroleum refinery process that is identical to the solutizer-steam regeneration process, except for the regeneration step; the newer units use uncatalyzed air regeneration. { sə'lüˌtīz·ər 'er rē'jen·ə·rəd·iv ˌprä·səs }

solutizer-steam regenerative process [CHEM ENG] A petroleum refinery process used to extract mercaptans from gasoline or naphtha; uses solutizers (potassium isobutyrate or potassium alkyl phenolate) in strong potassium hydroxide solution as the selective solvent. { sə'lüˌtīz·ər 'stēm rē'jen·ə·rəd·iv ˌprä·səs }

solutizer-tannin process [CHEM ENG] A petroleum refinery process that is an early variation of the solutizer-air regenerative process for extraction of mercaptans from gasoline; uses tannin-catalyzed oxidation for the regeneration step. { sə'lüˌtīz·ər 'tan·ən ˌprä·səs }

Solvay process [CHEM ENG] The process to make sodium carbonate and calcium chloride by treating sodium chloride with ammonia and carbon dioxide. { 'säl,vā ˌprä·səs }

solvent deasphalting [CHEM ENG] A petroleum refinery process used to remove asphaltic and resinous materials from reduced crude oils, lubricating oil stocks, gas oils, or middle distillates through the extractive or precipitant action of solvents. Also known as solvent deresining. { 'säl·vənt dē'asˌfólt·iŋ }

solvent deresining *See* solvent deasphalting. { 'säl·vənt diˌrez·ən·iŋ }

solvent dewaxing [CHEM ENG] A petroleum refinery process for solvent removal of wax from oils; the mixture of waxy oil and solvent is chilled, then filtered or centrifuged to remove the precipitated oil; the solvent is recovered for reuse. { 'säl·vənt diˌwaks·iŋ }

solvent extraction [CHEM ENG] The separation of materials of different chemical types and solubilities by selective solvent action; that is, some materials are more soluble in one solvent than in another, hence there is a preferential extractive action; used to refine petroleum products, chemicals, vegetable oils, and vitamins. { 'säl·vənt ikˌstrak·shən }

solvent molding [ENG] A process to form thermoplastic articles by dipping a mold into a solution or dispersion of the resin and drawing off (evaporating) the solvent to leave a plastic film adhering to the mold. { 'säl·vənt ˌmōld·iŋ }

solvent recovery [CHEM ENG] For reuse purposes, the catching and recovery of solvent vapors from vent lines, process vessels, or other sources of evaporative loss, usually with a solid adsorbent material. { 'säl·vənt riˌkəv·ə·rē }

solvent-refined [CHEM ENG] Pertaining to any product material whose final quality and condition is in part the result of a solvent treatment during processing of the feedstock material. { 'säl·vənt riˌfīnd }

solvent refining [CHEM ENG] The process of treating a mixed material with a solvent that preferentially dissolves and removes certain minor constituents (usually the undesired ones); common in the petroleum refining industry. { 'säl·vənt riˌfīn·iŋ }

solvent welding [ENG] A technique for joining plastic pipework in which a mixture of solvent and cement is applied to the pipe end and to the socket, with the parts then being joined and allowed to set. { 'säl·vənt ˌweld·iŋ }

sonar [ENG] **1.** A system that uses underwater sound, at sonic or ultrasonic frequencies, to detect and locate objects in the sea, or for communication; the commonest type is echo-ranging sonar; other versions are passive sonar, scanning sonar, and searchlight sonar. Derived from sound navigation and ranging. **2.** *See* sonar set. { 'sōˌnär }

sonar beacon [ENG ACOUS] An underwater beacon that transmits sonic or ultrasonic signals for the purpose of providing bearing information; it may have receiving facilities that permit triggering an external source. { 'sōˌnär ˌbē·kən }

sonar boomer transducer [ENG ACOUS] A sonar transducer that generates a large pressure wave in the surrounding water when a capacitor

bank discharges into a flat, epoxy-encapsulated coil, creating opposed magnetic fields from the coil and from eddy currents in an adjacent aluminum disk, which cause the disk to be driven away from the coils with great force. { 'sō,när 'büm·ər trans,dü·sər }

sonar capsule [ENG ACOUS] A capsule that reflects high-frequency sound waves; the sonar capsule, if attached to a reentry body, may be used to locate the reentry body. { 'sō,när ,kap·səl }

sonar dome [ENG] A streamlined, watertight enclosure that provides protection for a sonar transducer, sonar projector, or hydrophone and associated equipment, while offering minimum interference to sound transmission and reception. { 'sō,när ,dōm }

sonar projector [ENG ACOUS] An electromechanical device used under water to convert electrical energy to sound energy; a crystal or magnetostriction transducer is usually used for this purpose. { 'sō,när prə,jek·tər }

sonar set [ENG] A complete assembly of sonar equipment for detecting and ranging or for communication. Also known as sonar. { 'sō,när ,set }

sonar target [ENG ACOUS] An object which reflects a sufficient amount of a sonar signal to produce a detectable echo signal at the sonar equipment. { 'sō,när ,tär·gət }

sonar transducer [ENG ACOUS] A transducer used under water to convert electrical energy to sound energy and sound energy to electrical energy. { 'sō,när tranz,dü·sər }

sonar transmission [ENG ACOUS] The process by which underwater sound signals generated by a sonar set travel through the water. { 'sō,när tranz,mish·ən }

sonar window [ENG ACOUS] The portion of a sonar dome or sonar transducer that passes sound waves at sonar frequencies with little attenuation while providing mechanical protection for the transducer. { 'sō,när ,win·dō }

sonde [ENG] An instrument used to obtain weather data during ascent and descent through the atmosphere, in a form suitable for telemetering to a ground station by radio, as in a radiosonde. { sänd }

sonic altimeter [ENG] An instrument for determining the height of an aircraft above the earth by measuring the time taken for sound waves to travel from the aircraft to the surface of the earth and back to the aircraft again. { 'sän·ik al'tim·əd·ər }

sonic anemometer [ENG] An anemometer which measures wind speed by means of the properties of wind-borne sound waves; it operates on the principle that the propagation velocity of a sound wave in a moving medium is equal to the velocity of sound with respect to the medium plus the velocity of the medium. { 'sän·ik ,an·ə'mäm·əd·ər }

sonicate [ENG] To apply high-frequency sound waves to matter. { 'sän·ə,kāt }

sonicator [ENG ACOUS] An instrument for producing high-intensity ultrasound, consisting of a converter that transforms electrical energy into mechanical energy in the form of oscillation of piezoelectric transducers at a frequency of 20 kilohertz, and a titanium horn that focuses this oscillation and radiates energy into the liquid being treated through a tip. { 'sän·ə,kād·ər }

sonic chemical analyzer [ENG] A device to characterize the composition of a gas, liquid, or solid by the attenuation or change in the velocity of sound waves through a sample; the effect is related to molecular structure and intermolecular interactions. { 'sän·ik 'kem·ə·kəl 'an·ə,līz·ər }

sonic cleaning [ENG] Cleaning of contaminated materials by the action of intense sound in the liquid in which the material is immersed. { 'sän·ik 'klēn·iŋ }

sonic depth finder [ENG] A sonar-type instrument used to measure ocean depth and to locate underwater objects; a sound pulse is transmitted vertically downward by a piezoelectric or magnetostriction transducer mounted on the hull of the ship; the time required for the pulse to return after reflection is measured electronically. Also known as echo sounder. { 'sän·ik 'depth ,fīn·dər }

sonic detection and ranging *See* sodar. { ¦sän·ik di,tek·shən an 'rānj·iŋ }

sonic drilling [MECH ENG] The process of cutting or shaping materials with an abrasive slurry driven by a reciprocating tool attached to an audio-frequency electromechanical transducer and vibrating at sonic frequency. { 'sän·ik 'dril·iŋ }

sonic flaw detection [ENG] The process of locating imperfections in solid materials by observing internal reflections or a variation in transmission through the materials as a function of sound-path location. { 'sän·ik 'fló di,tek·shən }

sonic liquid-level meter [ENG] A meter that detects a liquid level by sonic-reflection techniques. { 'sän·ik 'lik·wəd ¦lev·əl ,mēd·ər }

sonic nucleation [CHEM ENG] In supersaturated solutions, the use of sonic or ultrasonic radiation to help bring about nucleation and corresponding crystallization of substances otherwise difficult to crystallize. { 'sän·ik ,nü·klē'ā·shən }

sonic sifter [MECH ENG] A high-speed vibrating apparatus used in particle size analysis. { 'sän·ik 'sif·tər }

sonic sounding [ENG] Determining the depth of the ocean bottom by measuring the time for an echo to return to a shipboard sound source. { 'sän·ik 'saůnd·iŋ }

sonic thermometer [ENG] A thermometer based upon the principle that the velocity of a sound wave is a function of the temperature of the medium through which it passes. { 'sän·ik thər'mäm·əd·ər }

sonic well logging [ENG] A well logging technique that uses a pulse-echo system to measure

the distance between the instrument and a sound-reflecting surface; used to measure the size of cavities around brine wells, and capacities of underground liquefied petroleum gas storage chambers. { 'sän·ik 'wel ˌläg·iŋ }

sonobuoy [ENG] An acoustic receiver and radio transmitter mounted in a buoy that can be dropped from an aircraft by parachute to pick up underwater sounds of a submarine and transmit them to the aircraft; to track a submarine, several buoys are dropped in a pattern that includes the known or suspected location of the submarine, with each buoy transmitting an identifiable signal; an electronic computer then determines the location of the submarine by comparison of the received signals and triangulation of the resulting time-delay data. Also known as radio sonobuoy. { 'sän·əˌbói }

sonograph [ENG] **1.** An instrument for recording sound or seismic vibrations. **2.** An instrument for converting sounds into seismic vibrations. { 'sän·əˌgraf }

sonometer [ENG] **1.** In general, any device which consists of a thin metallic wire stretched over two bridges that are usually mounted on a soundboard and which is used to measure the vibration frequency, tension, density, or diameter of the wire, or to verify relations between these quantities. Also known as monochord. **2.** In particular, an instrument for measuring rock stress by means of a piano wire stretched between two bolts in the rock; any change of pitch after destressing is observed and used to indicate stress. { səˈnäm·əd·ər }

sonoscan [ENG] A type of acoustic microscope in which an unfocused acoustic beam passes through the object and produces deformations in a liquid-solid interface that are sensed by a laser beam reflected from the surface. { 'sän·əˌskan }

soot blower [ENG] A system of steam or air jets used to maintain cleanliness, efficiency, and capacity of heat-transfer surfaces by the periodic removal of ash and slag from the heat-absorbing surfaces. { 'sůt ˌblō·ər }

sophisticated robot [CONT SYS] A robot that can be programmed and is controlled by a microprocessor. { səˈfis·təˌkād·əd 'rōˌbät }

sorption pumping [ENG] A technique used to reduce the pressure of gas in an atmosphere; the gas is adsorbed on a granular sorbent material such as a molecular sieve in a metal container; when this sorbent-filled container is immersed in liquid nitrogen, the gas is sorbed. { 'sȯrp·shən ˌpəmp·iŋ }

sound-field enhancement [ENG ACOUS] A system for enhancing the acoustical properties of both indoor and outdoor spaces, particularly for unamplified speech, song, and music; may consist of one or more microphones, systems for amplification and electronic signal processing, and one or more loudspeakers. { ¦saůn ˌfēld in 'hans·mənt }

sortie number [ENG] A reference used to identify the images taken by all the sensors during one air reconnaissance sortie. { 'sȯrd·ē ˌnəm·bər }

sorting table [ENG] Any horizontal conveyor where operators, along its side, sort bulk material, packages, or objects from the conveyor. { 'sȯrd·iŋ ˌtā·bəl }

sound analyzer [ENG] An instrument which measures the amount of sound energy in various frequency bands; it generally consists of a set of fixed electrical filters or a tunable electrical filter, along with associated amplifiers and a meter which indicates the filter output. { 'saůnd ˌan·əˌlīz·ər }

sound effects [ENG ACOUS] Mechanical devices or recordings used to provide lifelike imitations of various sounds. { 'saůnd iˌfeks }

sound film [ENG ACOUS] Motion picture film having a sound track along one side for reproduction of the sounds that are to accompany the film. { 'saůnd ˌfilm }

sound filmstrip [ENG ACOUS] A filmstrip that has accompanying sound on a separate disk or tape, which is manually or automatically synchronized with projection of the pictures in the strip. { 'saůnd 'filmˌstrip }

sound gate [ENG ACOUS] The gate through which film passes in a sound-film projector for conversion of the sound track into audio-frequency signals that can be amplified and reproduced. { 'saůnd ˌgāt }

sound head [ENG ACOUS] **1.** The section of a sound motion picture projector that converts the photographic or magnetic sound track to audible sound signals. **2.** In a sonar system, the cylindrical container for the transmitting projector and the receiving hydrophone. { 'saůnd ˌhed }

sounding [ENG] **1.** Determining the depth of a body of water by an echo sounder or sounding line. **2.** Measuring the depth of bedrock by driving a steel rod into the soil. **3.** Any penetration of the natural environment for scientific observation. { 'saůnd·iŋ }

sounding balloon [ENG] A small free balloon used for carrying radiosonde equipment aloft. { 'saůnd·iŋ bəˌlün }

sounding lead [ENG] A lead used for determining the depth of water. { 'saůnd·iŋ ˌled }

sounding line [ENG] The line attached to a sounding lead. Also known as lead line. { 'saůnd·iŋ ˌlīn }

sounding machine [ENG] An instrument for measuring the depth of water, consisting essentially of a reel of wire; to one end of this wire there is attached a weight which carries a device for measuring and recording the depth; a crank or motor reels in the wire. { 'saůnd·iŋ məˌshēn }

sounding pole [ENG] A pole or rod used for sounding in shallow water, and usually marked to indicate various depths. { 'saůnd·iŋ ˌpōl }

sounding sextant *See* hydrographic sextant. { 'saůnd·iŋ ˌsek·stənt }

sounding wire [ENG] A wire used with a sounding machine in determining depth of water. { 'saůnd·iŋ ˌwīr }

sound-level meter [ENG] An instrument used

to measure noise and sound levels in a specified manner; the meter may be calibrated in decibels or volume units and includes a microphone, an amplifier, an output meter, and frequency-weighting networks. { 'saund ˌlev·əl ˌmēd·ər }

sound locator [ENG ACOUS] A device formerly used to detect aircraft in flight by sound, consisting of four horns, or sound collectors (two for azimuth detection and two for elevation), together with their associated mechanisms and controls, which enabled the listening operator to determine the position and angular velocity of an aircraft. { 'saund ˌlōˌkād·ər }

sound navigation and ranging *See* sonar. { 'saund ˌnav·əˈgā·shən ən ˈrānj·iŋ }

sound-powered telephone [ENG ACOUS] A telephone operating entirely on current generated by the speaker's voice, with no external power supply; sound waves cause a diaphragm to move a coil back and forth between the poles of a powerful but small permanent magnet, generating the required audio-frequency voltage in the coil. { 'saund ˌpaù·ərd 'tel·əˌfōn }

sound production [ENG ACOUS] Conversion of energy from mechanical or electrical into acoustical form, as in a siren or loudspeaker. { 'saund prəˌdək·shən }

soundproofing *See* damping. { 'saund,prüf·iŋ }

sound ranging [ENG ACOUS] Determining the location of a gun or other sound source by measuring the travel time of the sound wave to microphones at three or more different known positions. { 'saund ˌrānj·iŋ }

sound reception [ENG ACOUS] Conversion of acoustical energy into another form, usually electrical, as in a microphone. { 'saund riˌsep·shən }

sound recording [ENG ACOUS] The process of recording sound signals so they may be reproduced at any subsequent time, as on a phonograph disk, motion picture sound track, or magnetic tape. { 'saund riˌkȯrd·iŋ }

sound-reinforcement system [ENG ACOUS] An electronic means for augmenting the sound output of a speaker, singer, or musical instrument in cases where it is either too weak to be heard above the general noise or too reverberant; basic elements of such a system are microphones, amplifiers, volume controls, and loudspeakers. Also known as public address system. { 'saund ˌrē·inˈfȯrs·mənt ˌsis·təm }

sound-reproducing system [ENG ACOUS] A combination of transducing devices and associated equipment for picking up sound at one location and time and reproducing it at the same or some other location and at the same or some later time. Also known as audio system; reproducing system; sound system. { 'saund ˌrē·prəˈdüs·iŋ ˌsis·təm }

sound reproduction [ENG ACOUS] The use of a combination of transducing devices and associated equipment to pick up sound at one point and reproduce it either at the same point or at some other point, at the same time or at some subsequent time. { 'saund ˌrē·prəˌdək·shən }

sound spectrograph [ENG ACOUS] An instrument that records and analyzes the spectral composition of audible sound. { 'saund 'spek·trəˌgraf }

sound speed [ENG] The speed of sound motion picture film, standardized at 24 frames per second (silent film speed is 18 frames per second). { 'saund ˌspēd }

soundstripe [ENG ACOUS] A longitudinal stripe of magnetic material placed on some motion picture films for recording a magnetic sound track. { 'saundˌstrīp }

sound system *See* sound-reproducing system. { 'saund ˌsis·təm }

sound track [ENG ACOUS] A narrow band, usually along the margin of a sound film, that carries the sound record; it may be a variable-width or variable-density optical track or a magnetic track. { 'saund ˌtrak }

sound transducer *See* electroacoustic transducer. { 'saund tranzˌdüs·ər }

sound trap [ELECTR] A wave trap in a television receiver circuit that prevents sound signals from entering the picture channels. [ENG ACOUS] A pit between adjoining instrument sections in a sound-recording studio, generally filled with fiberglass panels, to absorb sound that would otherwise propagate from instruments in one section to microphones in adjacent sections. { 'saund ˌtrap }

source [ELEC] The circuit or device that supplies signal power or electric energy or charge to a transducer or load circuit. [ELECTR] The terminal in a field-effect transistor from which majority carriers flow into the conducting channel in the semiconductor material. [THERMO] A device that supplies heat. { sȯrs }

source degeneration [ELECTR] The addition of a circuit element between a transistor source and ground, with several effects, including a reduction in gain. { ¦sȯrs diˌjen·əˈrā·shən }

source-follower amplifier *See* common-drain amplifier. { 'sȯrs 'fäl·ə·wər 'am·pləˌfī·ər }

space centrode [MECH] The path traced by the instantaneous center of a rotating body relative to an inertial frame of reference. { ¦spās 'senˌtrōd }

space cloth [CHEM ENG] Woven cloth or wire used for solids screening, and for which the openings between the fibers or strands are designated in terms of space or clear opening. { 'spās ˌklȯth }

space cone [MECH] The cone in space that is swept out by the instantaneous axis of a rigid body during Poinsot motion. Also known as herpolhode cone. { 'spās ˌkōn }

spacecraft ground instrumentation [ENG] Instrumentation located on the earth for monitoring, tracking, and communicating with manned spacecraft, satellites, and space probes. Also known as ground instrumentation. { 'spāsˌkraft 'graùnd ˌin·strəˌmənˈtā·shən }

spacecraft tracking [ENG] The determination of the positions and velocities of spacecraft

through radio and optical means. { 'spās,kraft ,trak·iŋ }

space detection and tracking system [ENG] System capable of detecting and tracking space vehicles from the earth, and reporting the orbital characteristics of these vehicles to a central control facility. Abbreviated SPADATS. { 'spās di'tek·shən ən 'trak·iŋ ,sis·təm }

spaced loading [ENG] Loading shot holes so that cartridges are separated by open spacers which do not prevent the concussion from one charge from reaching the next. { 'spāst 'lōd·iŋ }

space frame [BUILD] A three-dimensional steel building frame which is stable against wind loads. { 'spās ,frām }

space lattice [BUILD] A space frame built of lattice girders. { 'spās ,lad·əs }

space processing [ENG] The carrying out of various processes aboard orbiting spacecraft, utilizing the low-gravity, high-vacuum environment associated with these vehicles. { 'spās ,prä,ses·iŋ }

spacer [ENG] **1.** A piece of metal wire twisted at one end to form a guard to keep the explosive in a shothole in place and twisted at the other end to form a guard to hold the tamping in its place. **2.** A piece of wood doweling interposed between charges to extend the column of explosive. **3.** A device for holding two members at a given distance from each other. Also known as spacer block. **4.** The tapered section of a pug joining the barrel to the die; clay is compressed in this section before it issues through the die. { 'spās·ər }

spacer block *See* spacer. { 'spās·ər ,bläk }

space suit [ENG] A pressure suit for wear in space or at very low ambient pressures within the atmosphere, designed to permit the wearer to leave the protection of a pressurized cabin. { 'spās ,süt }

Space Tracking and Data Acquisition Network [ENG] A network of ground stations operated by the National Aeronautics and Space Administration, which tracks, commands, and receives telemetry for United States and foreign unmanned satellites. Abbreviated STADAN. { 'spās 'trak·iŋ ən 'dad·ə ,ak·wə'zish·ən ,net ,wərk }

space velocity [CHEM ENG] The relationship between feed rate and reactor volume in a flow process; defined as the volume or weight of feed (measured at standard conditions) per unit time per unit volume of reactor (or per unit weight of catalyst). { 'spās və,läs·əd·ē }

spackling [ENG] The process of repairing a part of a plaster wall or mural by cleaning out the defective spot and then patching it with a plastering material. { 'spak·liŋ }

SPADATS *See* space detection and tracking system. { 'spā,dats }

spade [DES ENG] A shovellike implement with a flat oblong blade; used for turning soil by pushing against the blade with the foot. { spād }

spade bolt [DES ENG] A bolt having a spade-shaped flattened head with a transverse hole, used to fasten shielded coils, capacitors, and other components to a chassis. { 'spād ,bōlt }

spade drill [DES ENG] A drill consisting of three main parts: a cutting blade, a blade holder or shank, and a device, such as a screw, which fastens the blade to the holder; used for cutting holes over 1 inch (2.54 centimeters) in diameter. { 'spād ,dril }

spade lug [DES ENG] An open-ended flat termination for a wire lead, easily slipped under a terminal nut. { 'spād ,ləg }

spall [ENG] **1.** To reduce irregular stone blocks to an approximate size by chipping with a hammer. **2.** To break off thin chips from, and parallel to, the surface of a material, such as a metal or rock. { spól }

spalling hammer [ENG] A heavy axlike hammer with chisel edge, used for breaking and rough-dressing stone. { 'spól·iŋ ,ham·ər }

span [ENG] A structural dimension measured between certain extremities. { span }

spandrel [BUILD] The part of a wall between the sill of a window and the head of the window below it. { 'span·drəl }

spandrel beam [BUILD] In steel or concrete construction, the exterior beam that extends from column to column and marks the floor level between stories. { 'span·drəl ,bēm }

spandrel frame [BUILD] A triangular framing, as below a stair. { 'span·drəl ,frām }

spandrel wall [BUILD] A wall on the outer surface of a vault to fill the spandrels. { 'span·drəl ,wòl }

spanner [DES ENG] A wrench with a semicircular head having a projection or hole at one end. [ENG] **1.** A horizontal brace. **2.** An artificial horizon attachment for a sextant. { 'span·ər }

spare part [ENG] In supply usage, any part, component, or subassembly kept in reserve for the maintenance and repair of major items of equipment. { 'spār 'pärt }

spare-parts list [ENG] List approved by designated authorities, indicating the total quantities of spare parts, tools, and equipment necessary for the maintenance of a specified number of major items for a definite period of time. { 'spār ,pärts ,list }

sparger *See* perforated-pipe distributor. { 'spär·jər }

sparging [CHEM ENG] The process of forcing air through water to remove undesirable gases. { 'spärj·iŋ }

spark [ELEC] A short-duration electric discharge due to a sudden breakdown of air or some other dielectric material separating two terminals, accompanied by a momentary flash of light. Also known as electric spark; spark discharge; sparkover. { spärk }

spark arrester [ENG] **1.** An apparatus that prevents sparks from escaping from a chimney. **2.** A device that reduces or eliminates electric sparks at a point where a circuit is opened and closed. { 'spärk ə,res·tər }

spark-coil leak detector [ENG] A coil similar to a Tesla coil which detects leaks in a vacuum

system by jumping a spark between the leak hole and the core of the coil. { 'spärk ¦kōil 'lēk di ˌtek·tər }

spark discharge *See* spark. { 'spärk 'disˌchärj }

spark-ignition combustion cycle *See* Otto cycle. { 'spärk igˌnish·ən kəm'bəs·chən ˌsī·kəl }

spark-ignition engine [MECH ENG] An internal combustion engine in which an electrical discharge ignites the explosive mixture of fuel and air. { 'spärk igˌnish·ən ˌen·jən }

sparking potential *See* breakdown voltage. { 'spärk·iŋ pəˌten·chəl }

sparking voltage *See* breakdown voltage. { 'spärk·iŋ ˌvōl·tij }

spark knock [MECH ENG] The knock produced in an internal combustion engine precedes the arrival of the piston at the top dead-center position. { 'spärk ˌnäk }

spark lead [MECH ENG] The amount by which the spark precedes the arrival of the piston at its top (compression) dead-center position in the cylinder of an internal combustion engine. { 'spärk ˌlēd }

sparkover-initiated discharge machining [MECH ENG] An electromachining process in which a potential is impressed between the tool (cathode) and workpiece (anode) which are separated by a dielectric material; a heavy discharge current flows through the ionized path when the applied potential is sufficient to cause rupture of the dielectric. { 'spärkˌō·vər iˌnish·ēˌād·əd 'dis ˌchärj məˌshēn·iŋ }

sparkproof [ENG] **1.** Treated with a material to prevent ignition or damage by sparks. **2.** Generating no sparks. { 'spärkˌprüf }

spark recorder [ENG] Recorder in which the recording paper passes through a spark gap formed by a metal plate underneath and a moving metal pointer above the paper; sparks from an induction coil pass through the paper periodically, burning small holes that form the record trace. { 'spärk ri'kȯrd·ər }

spatial linkage [MECH ENG] A linkage that involves motion in all three dimensions. { 'spā·shəl 'liŋ·kij }

spatter dash [CIV ENG] **1.** A finish put on stucco by dashing a mortar and sand mixture against it. **2.** Paint spattered on a different-colored ground coat. { 'spad·ər ˌdash }

speaker *See* loudspeaker. { 'spēk·ər }

speaker identification [ENG ACOUS] The use of automated equipment to find the identity of a talker, in a known population of talkers, using the speech input. { ˌspēk·ər ˌīˌdent·ə·tə'kā·shən }

speaker verification [ENG ACOUS] The use of automated equipment to authenticate a claimed speaker identity from a voice signal based on speaker-specific characteristics reflected in spoken words or sentences. Abbreviated SV. { ˌspēk·ər ˌver·i·fə'kā·shən }

spear [DES ENG] A rodlike fishing tool having a barbed-hook end, used to recover rope, wire line, and other materials from a borehole. { spir }

special cargo [IND ENG] Cargo which requires special handling or protection, such as pyrotechnics, detonators, watches, and precision instruments. { 'spesh·əl 'kär·gō }

special-purpose item [ENG] In supply usage, any item designed to fill a special requirement, and having a limited application; for example, a wrench or other tool designed to be used for one particular model of a piece of machinery. { 'spesh·əl ¦pər·pəs 'īd·əm }

special-purpose vehicle [ENG] A vehicle having a special chassis, or a general-purpose chassis incorporating major modifications, designed to fill a specialized requirement; all tractors (except truck tractors) and tracklaying vehicles, regardless of design, size, or intended purpose, are classified as special-purpose vehicles. { 'spesh·əl ¦pər·pəs 'vē·ə·kəl }

specifications [ENG] An organized listing of basic requirements for materials of construction, product compositions, dimensions, or test conditions; a number of organizations publish standards (for example, American Society of Mechanical Engineers, American Petroleum Institute, and American Society for Testing and Materials), and many companies have their own specifications. Also known as specs. [IND ENG] A quantitative description of the required characteristics of a device, machine, structure, product, or process. { ˌspes·ə·fə'kā·shənz }

specific charge [ELEC] The ratio of a particle's charge to its mass. { spə'sif·ik 'chärj }

specific conductance *See* conductivity. { spə'sif·ik kən'dək·təns }

specific energy [THERMO] The internal energy of a substance per unit mass. { spə'sif·ik 'en·ər·jē }

specific fuel consumption [MECH ENG] The weight flow rate of fuel required to produce a unit of power or thrust, for example, pounds per horsepower-hour. Abbreviated SFC. Also known as specific propellant consumption. { spə'sif·ik 'fyül kənˌsəm·shən }

specific gravity [MECH] The ratio of the density of a material to the density of some standard material, such as water at a specified temperature, for example, 4°C or 60°F, or (for gases) air at standard conditions of pressure and temperature. Abbreviated sp gr. Also known as relative density. { spə'sif·ik 'grav·əd·ē }

specific-gravity bottle [ENG] A small bottle or flask used to measure the specific gravities of liquids; the bottle is weighed when it is filled with the liquid whose specific gravity is to be determined, when filled with a reference liquid, and when empty. Also known as density bottle; relative-density bottle. { spə'sif·ik ¦grav·əd·ē ˌbäd·əl }

specific-gravity hydrometer [ENG] A hydrometer which indicates the specific gravity of a liquid, with reference to water at a particular temperature. { spə'sif·ik ¦grav·əd·ē hī'dräm·əd·ər }

specific heat [THERMO] **1.** The ratio of the amount of heat required to raise a mass of material 1 degree in temperature to the amount of

heat required to raise an equal mass of a reference substance, usually water, 1 degree in temperature; both measurements are made at a reference temperature, usually at constant pressure or constant volume. **2.** The quantity of heat required to raise a unit mass of homogeneous material one degree in temperature in a specified way; it is assumed that during the process no phase or chemical change occurs. { spə'sif·ik 'hēt }

specific inductive capacity *See* dielectric constant. { spə'sif·ik in'dək·tiv kə'pas·əd·ē }

specific insulation resistance *See* volume resistivity. { spə'sif·ik ˌin·sə'lā·shən riˌzis·təns }

specific propellant consumption *See* specific fuel consumption. { spə'sif·ik prə'pel·ənt kənˌsəm·shən }

specific resistance *See* electrical resistivity. { spə'sif·ik ri'zis·təns }

specific speed [MECH ENG] A number, N_s, used to predict the performance of centrifugal and axial pumps or hydraulic turbines: for pumps, $N_s = N\sqrt{Q}/H^{3/4}$; for turbines, $N_s = N\sqrt{P}/H^{5/4}$, where N_s is specific speed, N is the rotational speed in revolutions per minute, Q is the rate of flow in gallons per minute, H is head in feet, and P is shaft horsepower. { spə'sif·ik 'spēd }

specific surface [CHEM ENG] The surface area per unit weight or volume of a particulate solid; used in size-reduction (crushing and grinding) calculations. { spə'sif·ik 'sər·fəs }

specific volume [MECH] The volume of a substance per unit mass; it is the reciprocal of the density. Abbreviated sp vol. { spə'sif·ik 'väl·yəm }

specific weight [MECH] The weight per unit volume of a substance. { spə'sif·ik 'wāt }

specs *See* specifications. { speks }

spectral density *See* frequency spectrum. { 'spek·trəl 'den·səd·ē }

spectral emissivity [THERMO] The ratio of the radiation emitted by a surface at a specified wavelength to the radiation emitted by a perfect blackbody radiator at the same wavelength and temperature. { 'spek·trəl ˌē,mi'siv·əd·ē }

spectral hygrometer [ENG] A hygrometer which determines the amount of precipitable moisture in a given region of the atmosphere by measuring the attenuation of radiant energy caused by the absorption bands of water vapor; the instrument consists of a collimated energy source, separated by the region under investigation and a detector which is sensitive to those frequencies that correspond to the absorption bands of water vapor. { 'spek·trəl hī'gräm·əd·ər }

spectral pyrometer *See* narrow-band pyrometer. { 'spek·trəl pī'räm·əd·ər }

spectral response *See* spectral sensitivity. { 'spek·trəl ri'spdäns }

spectral sensitivity [ELECTR] Radiant sensitivity, considered as a function of wavelength. { 'spek·trəl ˌsen·sə'tiv·əd·ē }

spectrum analyzer [ENG] Test instrument used to show the distribution of energy contained in the frequencies emitted by a pulse magnetron; also used to measure the Q of resonant cavities and lines, and to measure the cold impedance of a magnetron. { 'spek·trəm 'anˌə,līz·ər }

speech amplifier [ENG ACOUS] An audio-frequency amplifier designed specifically for amplification of speech frequencies, as for public-address equipment and radiotelephone systems. { 'spēch ˌam·pləˌfī·ər }

speech clipper [ENG ACOUS] A clipper used to limit the peaks of speech-frequency signals, as required for increasing the average modulation percentage of a radiotelephone or amateur radio transmitter. { 'spēch ˌklip·ər }

speech coil *See* voice coil. { 'spēch ˌkȯil }

speech inverter *See* scrambler. { 'spēch inˌvərd·ər }

speech recognition [ENG ACOUS] The process of analyzing an acoustic speech signal to identify the linguistic message that was intended, so that a machine can correctly respond to spoken commands. { 'spēch ˌrek·ig'nish·ən }

speech scrambler *See* scrambler. { 'spēch ˌskram·blər }

speed [MECH] The time rate of change of position of a body without regard to direction; in other words, the magnitude of the velocity vector. { spēd }

speed cone [MECH ENG] A cone-shaped pulley, or a pulley composed of a series of pulleys of increasing diameter forming a stepped cone. { 'spēd ˌkōn }

speed lathe [MECH ENG] A light, pulley-driven lathe, usually without a carriage or back gears, used for work in which the tool is controlled by hand. { 'spēd ˌlāth }

speedometer [ENG] An instrument that indicates the speed of travel of a vehicle in miles per hour, kilometers per hour, or knots. { spi'däm·əd·ər }

speed-payload tradeoff [MECH ENG] The relationship between the maximum speed with which a machine can move a workpiece and the maximum weight of the workpiece. { 'spēd 'pā ˌlōd 'trādˌȯf }

speed-power product [ELECTR] The product of the gate speed or propagation delay of an electronic circuit and its power dissipation. { 'spēd'paù·ər ˌpräd·əkt }

speed reducer [MECH ENG] A train of gears placed between a motor and the machinery which it will drive, to reduce the speed with which power is transmitted. { 'spēd riˌdü·sər }

speed-reliability tradeoff [MECH ENG] The relationship between the maximum speed at which a machine can move a workpiece and the reliability with which the machine's operations can be achieved to some degree of satisfaction. { 'spēd riˌlī·ə'bil·ədē 'trādˌȯf }

Sperry process [CHEM ENG] The electrolytic manufacture of basic lead carbonate (white lead) from desilverized lead that contains some bismuth; impure lead collects at the anode, and carbon dioxide is passed into the solution to convert the lead to carbonate. { 'sper·ē ˌprä·səs }

sp gr *See* specific gravity.

spherical-coordinate robot [CONT SYS] A robot in which the degrees of freedom of the manipulator arm are defined primarily by spherical coordinates. { 'sfir·ə·kəl kō¦ȯrd·ən·ət 'rō,bät }

spherical pendulum [MECH] A simple pendulum mounted on a pivot so that its motion is not confined to a plane; the bob moves over a spherical surface. { 'sfir·ə·kəl 'pen·jə·ləm }

spherical stress [MECH] The portion of the total stress that corresponds to an isotropic hydrostatic pressure; its stress tensor is the unit tensor multiplied by one-third the trace of the total stress tensor. { 'sfir·ə·kəl 'stres }

spherometer [ENG] A device used to measure the curvature of a spherical surface. { sfə'räm·əd·ər }

spider [ELEC] A structure on the shaft of an electric rotating machine that supports the core or poles of the rotor, consisting of a hub, spokes, and rim, or some similar arrangement. [ENG] **1.** The part of an ejector mechanism which operates ejector pins in a molding press. **2.** In extrusion, the membranes which support a mandrel within the head-die assembly. [ENG ACOUS] A highly flexible perforated or corrugated disk used to center the voice coil of a dynamic loudspeaker with respect to the pole piece without appreciably hindering in-and-out motion of the voice coil and its attached diaphragm. [MECH ENG] In a universal joint, a part with four projections that is pivoted between the forked ends of two shafts and transmits motion between the shafts. Also known as cross. { 'spīd·ər }

spike [DES ENG] A large nail, especially one longer than 3 inches (7.6 centimeters), and often of square section. { spīk }

spike microphone [ENG ACOUS] A device for clandestine aural surveillance in which the sensor is a spike driven into the wall of the target area and mechanically coupled to the diaphragm of a microphone on the other side of the wall. { 'spīk ˌmī·krəˌfōn }

spill [ENG] The accidental release of some material, such as nuclear material or oil, from a container. { spil }

spill box [CIV ENG] A device such as a flume that maintains a constant head on a measuring weir or orifice. { 'spil ˌbäks }

spillway [CIV ENG] A passage in or about a dam or other hydraulic structure for escape of surplus water. { 'spilˌwā }

spillway apron [CIV ENG] A concrete or timber floor at the bottom of a spillway to prevent soil erosion from heavy or turbulent flow. { 'spilˌwā ˌā·prən }

spillway channel [CIV ENG] An outlet channel from a spillway. { 'spilˌwā ˌchan·əl }

spillway dam *See* overflow dam. { 'spilˌwā ˌdam }

spillway gate [CIV ENG] A gate for regulating the flow from a reservoir. { 'spilˌwā ˌgāt }

spin [MECH] Rotation of a body about its axis. { spin }

spincasting [ENG] A technique for manufacturing telescope mirrors in which molten glass is poured into a rotating mold and, as the glass cools and solidifies, the surface of the relatively thin mirror takes on a shape that is relatively close to the desired one, reducing substantially the need for grinding away excess glass. { 'spin ˌkast·iŋ }

spin compensation [MECH] Overcoming or reducing the effect of projectile rotation in decreasing the penetrating capacity of the jet in shaped-charge ammunition. { 'spin ˌkäm·pən ˌsā·shən }

spin-decelerating moment [MECH] A couple about the axis of the projectile, which diminishes spin. { 'spin di¦sel·əˌrād·iŋ 'mō·mənt }

spindle [DES ENG] A short, slender or tapered shaft. { 'spin·dəl }

spin electronics *See* magnetoelectronics. { 'spin ˌi·lekˌträn·iks }

spinner [ENG] **1.** Automatically rotatable radar antenna, together with directly associated equipment. **2.** Part of a mechanical scanner which rotates about an axis, generally restricted to cases where the speed of rotation is relatively high. { 'spin·ər }

spinneret [ENG] An extrusion die with many holes through which plastic melt is forced to form filaments. { ˌspin·ə'ret }

spinning [ENG] The extrusion of a spinning solution (such as molten plastic) through a spinneret. [MECH ENG] Shaping and finishing sheet metal by rotating the workpiece over a mandrel and working it with a round-ended tool. Also known as metal spinning. { 'spin·iŋ }

spinning machine [MECH ENG] **1.** A machine that winds insulation on electric wire. **2.** A machine that shapes metal hollow ware. { 'spin·iŋ məˌshēn }

spin transistor *See* magnetic switch. { 'spin tranˌzis·tər }

spintronics *See* magnetoelectronics. { spin'trän·iks }

spin valve *See* magnetic switch. { 'spin ˌvalv }

spin welding [ENG] Fusion of two objects (for example, plastics) by forcing them together while one of the pair is spinning; frictional heat melts the interface, spinning is stopped, and the bodies are held together until they are frozen in place (welded). { 'spin ˌweld·iŋ }

spiral bevel gear [DES ENG] Bevel gear with curved, oblique teeth to provide gradual engagement and bring more teeth together at a given time than an equivalent straight bevel gear. { 'spī·rəl 'bev·əl ˌgir }

spiral chute [DES ENG] A gravity chute in the form of a continuous helical trough spiraled around a column for conveying materials to a lower level. { 'spī·rəl 'shüt }

spiral conveyor *See* screw conveyor. { 'spī·rəl kən'vā·ər }

spiral flow tank [CIV ENG] An aeration tank of the activated sludge process into which air is diffused in a spiral helical movement guided by

baffles and proper location of diffusers. { 'spī·rəl 'flō ˌtaŋk }

spiral flow test [ENG] The determination of the flow properties of a thermoplastic resin by measuring the length and weight of resin flowing along the path of a spiral cavity. { 'spī·rəl 'flō ˌtest }

spiral gage *See* spiral pressure gage. { 'spī·rəl 'gāj }

spiral gear [MECH ENG] A helical gear that transmits power from one shaft to another, nonparallel shaft. { 'spī·rəl ˌgir }

spiral-jaw clutch [MECH ENG] A modification of the square-jaw clutch permitting gradual meshing of the mating faces, which have a helical section. { 'spī·rəl ˌjȯ ˌkləch }

spiral mold cooling [ENG] Cooling an injection mold by passing a liquid through a spiral cavity in the body of the mold. { 'spī·rəl ˌmōld 'kül·iŋ }

spiral pipe [DES ENG] Strong, lightweight steel pipe with a single continuous welded helical seam from end to end. { 'spī·rəl 'pīp }

spiral plate exchanger [CHEM ENG] A heat-transfer device made from a pair of plates rolled in a spiral to provide two relatively long, rectangular passages for heat-transfer between fluids in countercurrent flow. { 'spī·rəl ˌplāt iks 'chān·jər }

spiral pressure gage [ENG] A device for measurement of pressures; a hollow tube spiral receives the system pressure which deforms (unwinds) the spiral in direct relation to the pressure in the tube. Also known as spiral gage. { 'spī·rəl 'presh·ər ˌgāj }

spiral scanning [ENG] Scanning in which the direction of maximum radiation describes a portion of a spiral; the rotation is always in one direction; used with some types of radar antennas. { 'spī·rəl 'skan·iŋ }

spiral spring [DES ENG] A spring bar or wire wound in an Archimedes spiral in a plane; each end is fastened to the force-applying link of the mechanism. { 'spī·rəl 'spriŋ }

spiral thermometer [ENG] A temperature-measurement device consisting of a bimetal spiral that winds tighter or opens with changes in temperature. { 'spī·rəl thər'mäm·əd·ər }

spiral-tube heat exchanger [ENG] A countercurrent heat-exchange device made of a group of concentric spirally wound coils, generally connected by manifolds; used for cryogenic exchange in air-separation plants. { 'spī·rəl ˌtüb 'hēt iksˌchān·jər }

spiral welded pipe [DES ENG] A steel pipe made of long strips of steel plate fitted together to form helical seams, which are welded. { 'spī·rəl ˌweld·əd 'pīp }

spirit level *See* level. { 'spir·ət ˌlev·əl }

spirit thermometer [ENG] A temperature-measurement device consisting of a closed capillary tube with a liquid (for example, alcohol) reservoir bulb at the bottom; as the bulb is heated, the liquid expands up into the capillary tubing, indicating the temperature of the bulb. { 'spir·ət thər'mäm·əd·ər }

spit [ENG] To light a fuse. { spit }

spitted fuse [ENG] A slow-burning fuse which has been cut open at the lighting end for ease of ignition. { 'spid·əd 'fyüz }

spitting rock [ENG] A rock mass under stress that breaks and ejects small fragments with considerable velocity. { 'spid·iŋ ˌräk }

splash block [BUILD] A small masonry block with a concave surface placed on the ground below a downspout at a sloping angle to carry roof drainage water away from a building and to prevent erosion of the soil. { 'splash ˌbläk }

splash lubrication [ENG] An engine-lubrication system in which the connecting-rod bearings dip into troughs of oil, splashing the oil onto the cylinder and piston rods. { 'splash ˌlü·brəˌkā·shən }

splay [ENG] A slanted or beveled surface making an oblique angle with another surface. { splā }

splayed arch [CIV ENG] An arch whose opening has a larger radius in front than at the back. { 'splād 'ärch }

splice [ELEC] A joint used to connect two lengths of conductor with good mechanical strength and good conductivity. [ENG] To unite two parts, such as rope or wire, to form a continuous length. { splīs }

splice plate [CIV ENG] A plate for joining the web plates or the flanges of girders. { 'splīs ˌplāt }

spline [DES ENG] One of a number of equally spaced keys cut integral with a shaft, or similarly, keyways in a hubbed part; the mated pair permits the transmission of rotation or translatory motion along the axis of the shaft. [ENG] A strip of wood, metal, or plastic. { splīn }

spline broach [MECH ENG] A broach for cutting straight-sided splines, or multiple keyways in holes. { 'splīn ˌbrōch }

splined shaft [DES ENG] A shaft with longitudinal gearlike ridges along its interior or exterior surface. { 'splīnd 'shaft }

split barrel [DES ENG] A core barrel that is split lengthwise so that it can be taken apart and the sample removed. { 'split 'bar·əl }

split-barrel sampler [DES ENG] A drive-type soil sampler with a split barrel. { 'split ˌbar·əl 'sam·plər }

split bearing [DES ENG] A shaft bearing composed of two pieces bolted together. { 'split 'ber·iŋ }

split cavity [ENG] A cavity, such as in a mold, made in sections. { 'split 'kav·əd·ē }

split link [DES ENG] A metal link in the shape of a two-turn helix pressed together. { 'split 'liŋk }

splitnut [ENG] A nut cut axially into halves to allow for rapid engagement (closed) or disengagement (open). { 'splitˌnət }

split pin [DES ENG] A pin with a split at one end so that it can be spread to hold it in place. { 'split 'pin }

split-ring core lifter [DES ENG] A hardened steel ring having an open slit, an outside taper, and

an inside or outside serrated surface; in its expanded state it allows the core to pass through it freely, but when the drill string is lifted, the outside taper surface slides downward into the bevel of the bit or reaming shell, causing the ring to contract and grip tightly the core which it surrounds. Also known as core catcher; core gripper; core lifter; ring lifter; split-ring lifter; spring lifter. { 'split ¦riŋ 'kȯr ˌlif·tər }

split-ring lifter *See* split-ring core lifter. { 'split ¦riŋ 'lif·tər }

split-ring mold [ENG] A plastics mold in which a split-cavity block is assembled in a chase to permit the forming of undercuts in a molded piece. { 'split ¦riŋ 'mōld }

split-ring piston packing [MECH ENG] A metal ring mounted on a piston to prevent leakage along the cylinder wall. { 'split ¦riŋ 'pis·tən ˌpak·iŋ }

split shovel [DES ENG] A shovel containing parallel troughs separated by slots; used for sampling ground ore. { 'split 'shəv·əl }

split-stator variable capacitor [ELECTR] Variable capacitor having a rotor section that is common to two separate stator sections; used in grid and plate tank circuits of transmitters for balancing purposes. { 'split ¦stād·ər 'ver·ē·ə·bəl kə'pas·əd·ər }

splitter [CHEM ENG] A petroleum-refinery term for a fractionating tower that produces only an overhead and bottom stream. { 'splid·ər }

splitter vanes [ENG] A group of curved, parallel vanes located in a sharp (for example, miter) bend of a gas conduit; the vane shape and its location help guide the moving gas around the bend. { 'splid·ər ˌvānz }

split transducer [ENG] A directional transducer with electroacoustic transducing elements which are divided and arranged so that there is an electrical separation of each division. { 'split tranz'dü·sər }

SP logging *See* spontaneous-potential well logging. { ¦es¦pē 'läg·iŋ }

spoke [DES ENG] A bar or rod radiating from the center of a wheel. { spōk }

spokeshave [ENG] A small tool for planing convex or concave surfaces. { 'spōkˌshāv }

sponge [CHEM ENG] Wood shavings coated with iron oxide and used as a catalyst in processes for removing hydrogen sulfide from industrial gases. { spənj }

spongy [MECH ENG] Property of a robot whose end effector has high compliance, so that a small force applied to it results in a large motion. { 'spən·jē }

spontaneous combustion *See* autoignition. { spän'tā·nē·əs kəm'bəs·chən }

spontaneous-potential well logging [ENG] The recording of the natural electrochemical and electrokinetic potential between two electrodes, one above the other, lowered into a drill hole; used to detect permeable beds and their boundaries. Also known as SP logging. { spän'tā·nē·əs pə'ten·chəl ¦wel ˌläg·iŋ }

spontaneous process [THERMO] A thermodynamic process which takes place without the application of an external agency, because of the inherent properties of a system. { spän'tā·nē·əs 'prä·səs }

spool [MECH ENG] **1.** The drum of a hoist. **2.** The movable part of a slide-type hydraulic valve. { spül }

spool-type roller conveyor [MECH ENG] A type of roller conveyor in which the rolls are of conical or tapered shape with the diameter at the ends of the roll larger than that at the center. { 'spül ¦tīp 'rō·lər kənˌvā·ər }

spoon [DES ENG] A slender rod with a cup-shaped projection at right angles to the rod, used for scraping drillings out of a borehole. { spün }

spot check [IND ENG] A check or inspection of certain steps in an operation, process, or the like, of certain parts of a piece of equipment or of a representative lot of completed parts or articles; the steps or parts inspected would normally be only a small percentage of the total. { 'spät ˌchek }

spot drilling [MECH ENG] Drilling a small hole or indentation in the surface of a material to serve as a centering guide in later machining operations. { 'spät ˌdril·iŋ }

spot facing [MECH ENG] A finished circular surface around the top of a hole to seat a bolthead or washer, or to allow flush mounting of mating parts. { 'spät ˌfās·iŋ }

spot gluing [ENG] Applying heat to a glued assembly by dielectric heating to make the glue set in spots that are more or less regularly distributed. { 'spät ˌglü·iŋ }

spotting [ENG] Fitting one part of a die to another part by applying an oil color to the surface of the finished part and bringing this against the surface of the intended mating part, the high spots being marked by the transferred color. { 'späd·iŋ }

spouting [ENG] A term used in the feeding or ejection of powdered or granulated solids by means of vertical or slanted discharge spouts. { 'spaůd·iŋ }

sprag [ENG] A stake used as a brake for a vehicle by inserting it through the spokes of a wheel or digging it into the ground at an angle. { sprag }

sprag clutch [MECH ENG] A clutch designed to transmit power in one direction only. { 'sprag ˌkləch }

spray [ENG] A mechanically produced dispersion of liquid into a gas stream; as drops are large, the spray is unstable and the liquid will fall free of the gas stream when velocity decreases. { 'sprā }

spray chamber [MECH ENG] A compartment in an air conditioner where humidification is conducted. { 'sprā ˌchām·bər }

spray dryer [MECH ENG] A machine for drying an atomized mist by direct contact with hot gases. { 'sprā ¦drī·ər }

sprayed metal mold [ENG] A plastics mold made by spraying molten metal onto a master

form until a shell of predetermined thickness is achieved; the shell is then removed and backed up with plaster, cement, or casting resin; used primarily in plastic sheet forming. { 'sprād ¦med·əl ˌmōld }

sprayer plate [ENG] A rotating flat-faced or dished metal plate used in an oil burner to enhance atomization. { 'sprā·ər ˌplāt }

spray gun [MECH ENG] An apparatus shaped like a gun which delivers an atomized mist of liquid. { 'sprā ˌgən }

spray nozzle [MECH ENG] A device in which a liquid is subdivided to form a stream (mist) of small drops. { 'sprā ˌnäz·əl }

spray painting [ENG] Applying a fine, even coat of paint by means of a spray nozzle. { 'sprā ˌpānt·iŋ }

spray pond [ENG] An arrangement for cooling large quantities of water in open reservoirs or ponds; nozzles spray a portion of the water into the air for the evaporative cooling effect. { 'sprā ˌpänd }

spray probe [ENG] A device which detects a jet spray of tracer gas in vacuum testing for leaks. { 'sprā ˌprōb }

spray torch [ENG] In thermal spraying, a device used for the application of self-fluxing alloys; molten metal is propelled against the substrate by a stream of air and gas. { 'sprā ˌtȯrch }

spray tower [CHEM ENG] A vertical column, at the top of which is a liquid spray device; used to contact liquids with gas streams for absorption, humidification, or drying. { 'sprā ˌtau̇·ər }

spray-up [ENG] A term for a number of techniques in which a spray gun is used as the processing tool; for example, in reinforced plastics manufacture, fibrous glass and resin can simultaneously be spray-deposited into a mold or onto a form. { 'sprāˌəp }

spread [ENG] The layout of geophone groups from which data from a single shot are recorded simultaneously. { spred }

spreadable life *See* pot life. { 'spred·ə·bəl ˌlīf }

spreader [CIV ENG] A wood or steel member inserted temporarily between form walls to keep them apart. [ELEC] An insulating crossarm used to hold apart the wires of a transmission line or multiple-wire antenna. [MECH ENG] **1.** A tool used in sharpening machine drill bits. **2.** A machine which spreads dumped material with its blades. { 'spred·ər }

spreader beam [ENG] A rigid beam hanging from a crane hook and fitted with a number of ropes at different points along its length; employed for such purposes as lifting reinforced concrete piles or large sheets of glass. { 'spred·ər ˌbēm }

spreader stoker [MECH ENG] A coal-burning system where mechanical feeders and distributing devices form a thin fuel bed on a traveling grate, intermittent-cleaning dump grate, or reciprocating continuous-cleaning grate. { 'spred·ər ˌstōk·ər }

spread footing [CIV ENG] A wide, shallow footing usually made of reinforced concrete. { 'spred ˌfud·iŋ }

spreading coefficient [THERMO] The work done in spreading one liquid over a unit area of another, equal to the surface tension of the stationary liquid, minus the surface tension of the spreading liquid, minus the interfacial tension between the liquids. { 'spred·iŋ ˌkō·iˌfish·ənt }

Sprengel pump [MECH ENG] An air pump that exhausts by trapping gases between drops of mercury in a tube. { 'spreŋ·gəl ˌpəmp }

sprig [DES ENG] A small brad having no head. [ENG] *See* glazier's point. { sprig }

spring [ENG] To enlarge the bottom of a drill hole by small charges of a high explosive in order to make room for the full charge; to chamber a drill hole. [MECH ENG] An elastic, stressed, stored-energy machine element that, when released, will recover its basic form or position. Also known as mechanical spring. { spriŋ }

spring balance [ENG] An instrument which measures force by determining the extension of a helical spring. { 'spriŋ ¦bal·ənts }

spring bolt [DES ENG] A bolt which must be retracted by pressure and which is shot into place by a spring when the pressure is released. { 'spriŋ ˌbōlt }

spring box mold [ENG] A compression mold with a spacing fork that is removed after partial compression. { 'spriŋ 'bäks ˌmōld }

spring buffer [ENG] A buffer in the form of a spring that stores and dissipates the kinetic energy of an impact. { 'spriŋ ˌbəf·ər }

spring calipers [ENG] Calipers in which tension against the adjusting nut is maintained by a circular spring. { 'spriŋ ¦kal·ə·pərz }

spring clip [DES ENG] **1.** A U-shaped fastener used to attach a leaf spring to the axle of a vehicle. **2.** A clip that grips an inserted part under spring pressure; used for electrical connections. { 'spriŋ ˌklip }

spring collet [DES ENG] A bushing that surrounds and holds the end of the work in a machine tool; the bushing is slotted and tapered, and when the collet is slipped over it, the slot tends to close and the bushing thereby grips the work. { 'spriŋ ¦käl·ət }

spring cotter [DES ENG] A cotter made of an elastic metal that has been bent double to form a split pin. { 'spriŋ ¦käd·ər }

spring coupling [MECH ENG] A flexible coupling with resilient parts. { 'spriŋ ¦kəp·liŋ }

spring die [DES ENG] An adjustable die consisting of a hollow cylinder with internal cutting teeth, used for cutting screw threads. { 'spriŋ ¦dī }

spring faucet [ENG] A faucet that is kept closed by a spring; force must be exerted to open it, and it closes when the force is removed. { 'spriŋ ¦fȯs·ət }

spring gravimeter [ENG] An instrument for making relative measurements of gravity; the elongation s of the spring may be considered proportional to gravity g, $s = (1/k)g$, and the basic

formula for relative measurements is $g_2 - g_1 = k(s_2 - s_1)$. { 'spriŋ grə'vim·əd·ər }

spring hammer [MECH ENG] A machine-driven hammer actuated by a compressed spring or by compressed air. { 'spriŋ ˌham·ər }

spring hinge [DES ENG] A hinge fitted with one or more springs. { 'spriŋ ˌhinj }

spring hook [DES ENG] A hook closed at the end by a spring snap. Also known as snap hook. { 'spriŋ ˌhůk }

spring-joint caliper [DES ENG] An outside or inside caliper having a heavy spring joining the legs together at the top; legs are opened and closed by a knurled nut. { 'spriŋ ˌjȯint ˌkal·ə·pər }

spring lifter *See* split-ring core lifter. { 'spriŋ ˌlif·tər }

spring-load [ENG] To load or exert a force on an object by means of tension from a spring or by compression. { 'spriŋ ˌlōd }

spring-loaded meter [ENG] A variable-area flowmeter in which the force on an obstruction in a tapered tube created by the fluid flowing past the obstruction is balanced by the force of a spring to which the obstruction is attached, and the resulting differential pressure is used to determine the flow rate. { 'spriŋ ˌlōd·əd 'mēd·ər }

spring-loaded regulator [MECH ENG] A pressure-regulator valve for pressure vessels or flow systems; the regulator is preloaded by a calibrated spring to open (or close) at the upper (or lower) limit of a preset pressure range. { 'spriŋ ˌlōd·əd 'reg·yəˌlād·ər }

spring modulus [MECH] The additional force necessary to deflect a spring an additional unit distance; if a certain spring has a modulus of 100 newtons per centimeter, a 100-newton weight will compress it 1 centimeter, a 200-newton weight 2 centimeters, and so on. { 'spriŋ 'mäj·ə·ləs }

spring pin [MECH ENG] An iron rod which is mounted between spring and axle on a locomotive, and which maintains a regulated pressure on the axle. { 'spriŋ ˌpin }

spring scale [ENG] A scale that utilizes the deflection of a spring to measure the load. { 'spriŋ ˌskāl }

spring shackle [ENG] A shackle for supporting the end of a spring, permitting the spring to vary in length as it deflects. { 'spriŋ ˌshak·əl }

spring stop-nut locking fastener [DES ENG] A locking fastener that functions by a spring action clamping down on the bolt. { 'spriŋ ˌstäpˌnət 'läk·iŋ ˌfas·nər }

spring switch [CIV ENG] A railroad switch that contains a spring to return it to the running position after it has been thrown over by trailing wheels moving on the diverging route. { 'spriŋ ˌswich }

sprinkler system [ENG] A fire-protection system of pipes and outlets in a building, mine, or other enclosure for delivering a fire extinguishing liquid or gas, usually automatically by the action of heat on the sprinkler head. Also known as fire sprinkling system. { 'spriŋk·lər ˌsis·təm }

sprocket [DES ENG] A tooth on the periphery of a wheel or cylinder to engage in the links of a chain, the perforations of a motion picture film, or other similar device. { 'spräk·ət }

sprocket chain [MECH ENG] A continuous chain which meshes with the teeth of a sprocket and thus can transmit mechanical power from one sprocket to another. { 'spräk·ət ˌchān }

sprocket hole [ENG] One of a series of perforations at the edge of a motion picture film, paper tape, or roll of continuous stationery, which are engaged by the teeth of a sprocket wheel to drive the material through some device. { 'spräk·ət ˌhōl }

sprocket wheel [DES ENG] A wheel with teeth or cogs, used for a chain drive or to engage the blocks on a cable. { 'spräk·ət ˌwēl }

sprue [ENG] **1.** A feed opening or vertical channel through which molten material, such as metal or plastic, is poured in an injection or transfer mold. **2.** A slug of material that solidifies in the channel. { sprü }

sprue bushing [ENG] A steel insert in an injection mold which contains the sprue hole and has a seat for the injection cylinder nozzle. { 'sprü ˌbůsh·iŋ }

sprue gate [ENG] A passageway for the flow of molten resin from the nozzle to the mold cavity. { 'sprü ˌgāt }

sprue puller [ENG] A pin with a Z-shaped slot to pull the sprue out of the sprue bushing in an injection mold. { 'sprü ˌpůl·ər }

sprung axle [MECH ENG] A supporting member for carrying the rear wheels of an automobile. { 'sprəŋ ˌak·səl }

sprung weight [MECH ENG] The weight of a vehicle which is carried by the springs, including the frame, radiator, engine, clutch, transmission, body, load, and so forth. { 'sprəŋ ˌwāt }

spud [DES ENG] **1.** A diamond-point drill bit. **2.** An offset type of fishing tool used to clear a space around tools stuck in a borehole. **3.** Any of various spade- or chisel-shaped tools or mechanical devices. **4.** *See* grouser. { spəd }

spur dike *See* groin. { 'spər ˌgir }

spur gear [DES ENG] A toothed wheel with radial teeth parallel to the axis. { 'spər ˌgir }

spur pile *See* batter pile. { 'spər ˌpīl }

sputtering [ELECTR] Also known as cathode sputtering. **1.** The ejection of atoms or groups of atoms from the surface of the cathode of a vacuum tube as the result of heavy-ion impact. **2.** The use of this process to deposit a thin layer of metal on a glass, plastic, metal, or other surface in vacuum. { 'spəd·ə·riŋ }

sputter-ion pump *See* getter-ion pump. { 'spəd·ər ˌī,än ˌpəmp }

sp vol *See* specific volume.

sq *See* square.

square [MECH] Denotes a unit of area; if x is a unit of length, a square x is the area of a square whose sides have a length of $1x$; for example, a square meter, or a meter squared, is the area of

a square whose sides have a length of 1 meter. Also known as monomino. Abbreviated sq. { skwer }

square-edged orifice [ENG] An orifice plate with straight-through edges for the hole through which fluid flows; used to measure fluid flow in fluid conduits by means of differential pressure drop across the orifice. { 'skwer ¦ejd 'ȯr·ə·fəs }

square engine [MECH ENG] An engine in which the stroke is equal to the cylinder bore. { 'skwer 'en·jən }

square-head bolt [DES ENG] A cylindrical threaded fastener with a square head. { 'skwer ¦hed ˌbōlt }

square-jaw clutch [MECH ENG] A type of positive clutch consisting of two or more jaws of square section which mesh together when they are aligned. { 'skwer ¦jȯ ˌkləch }

square joint *See* straight joint. { ¦skwer ¦jȯint }

square key [DES ENG] A machine key of square, usually uniform, but sometimes tapered, cross section. { 'skwer 'kē }

square mesh [DES ENG] A wire-cloth textile mesh count that is the same in both directions. { 'skwer 'mesh }

square-nose bit *See* flat-face bit. { 'skwer ¦nōz ˌbit }

square thread [DES ENG] A screw thread having a square cross section; the width of the thread is equal to the pitch or distance between threads. { 'skwer 'thred }

square wave [ELEC] An oscillation the amplitude of which shows periodic discontinuities between two values, remaining constant between jumps. { 'skwer 'wāv }

square-wave amplifier [ELECTR] Resistance-coupled amplifier, the circuit constants of which are to amplify a square wave with the minimum amount of distortion. { 'skwer ¦wāv 'am·pləˌfī·ər }

square-wave generator [ELECTR] A signal generator that generates a square-wave output voltage. { 'skwer ¦wāv 'jen·əˌrād·ər }

square-wave response [ELECTR] The response of a circuit or device when a square wave is applied to the input. { 'skwer ¦wāv riˌspäns }

square wheel [DES ENG] A wheel with a flat spot on its rim. { 'skwer ¦wēl }

squaring circuit [ELECTR] **1.** A circuit that reshapes a sine or other wave into a square wave. **2.** A circuit that contains nonlinear elements proportional to the square of the input voltage. { 'skwer·iŋ ˌsər·kət }

squaring shear [MECH ENG] A machine tool consisting of one fixed cutting blade and another mounted on a reciprocating crosshead; used for cutting sheet metal or plate. { 'skwer·iŋ ˌshir }

squawker *See* midrange. { 'skwȯk·ər }

squeegee [DES ENG] A device consisting of a handle with a blade of rubber or leather set transversely at one end and used for spreading, pushing, or wiping liquids off or across a surface. { 'skwēˌjē }

squeeze [ENG] **1.** To inject a grout into a borehole under high pressure. **2.** The plastic movement of a soft rock in the walls of a borehole or mine working that reduced the diameter of the opening. { skwēz }

squeeze roll [MECH ENG] A roller designed to exert pressure on material passing between it and a similar roller. { 'skwēz ˌrōl }

squib [ENG] A small tube filled with fine-grained black powder; upon the lighting and burning of the ignition match, the squib assumes a rocket effect and darts back into the hole to ignite the powder charge. { skwib }

SQUID *See* superconducting quantum interference device. { skwid }

squirt can [ENG] An oil can with a flexible bottom and a tapered spout; pressure applied to the bottom forces oil out the spout. { 'skwərt ˌkan }

squirt gun [ENG] A device with a bulb and nozzle; when the bulb is pressed, liquid squirts from the nozzle. { 'skwərt ˌgən }

SRA-size [ENG] One of a series of sizes to which untrimmed paper is manufactured; for reels of paper the standard sizes are 450, 640, 900, and 1280 millimeters; for sheets of paper the sizes are SRA0, 900 × 1280 millimeters; SRA1, 640 × 900 millimeters; and SRA2, 450 × 640 millimeters; SRA sizes correspond to A sizes when trimmed. { ¦esˌ¦ärˈā ˌsīz }

stab [ENG] In a drilling operation, to insert the threaded end of a pipe joint into the collar of the joint already placed in the hole and to rotate it slowly to engage the threads before screwing up. { stab }

stability [CONT SYS] The property of a system for which any bounded input signal results in a bounded output signal. [ENG] The property of a body, as an aircraft, rocket, or ship, to maintain its attitude or to resist displacement, and, if displaced, to develop forces and moments tending to restore the original condition. [MECH] *See* dynamic stability. { stəˈbil·əd·ē }

stability criterion [CONT SYS] A condition which is necessary and sufficient for a system to be stable, such as the Nyquist criterion, or the condition that poles of the system's overall transmittance lie in the left half of the complex-frequency plane. { stəˈbil·əd·ē krīˌtir·ē·ən }

stability exchange principle [CONT SYS] In a linear system, which is either dynamically stable or unstable depending on the value of a parameter, the complex frequency varies with the parameter in such a way that its real and imaginary parts pass through zero simultaneously; the principle is often violated. { stəˈbil·əd·ē iksˈchānj ˌprin·sə·pəl }

stability factor [ELECTR] A measure of a transistor amplifier's bias stability, equal to the rate of change of collector current with respect to reverse saturation current. { stəˈbil·əd·ē ˌfak·tər }

stability matrix *See* stiffness matrix. { stəˈbil·əd·ē ˌmā·triks }

stability test [ENG] Accelerated test to determine the probable suitability of an explosive material for long-term storage. { stə'bil·əd·ē ˌtest }

stabilization [CHEM ENG] A petroleum-refinery process for separating light gases from petroleum or gasoline, thus leaving a stable (less volatile) liquid so that it can be handled or stored with less change in composition. *See* compensation. [ELECTR] Feedback introduced into vacuum tube or transistor amplifier stages to reduce distortion by making the amplification substantially independent of electrode voltages and tube constants. [ENG] Maintenance of a desired orientation independent of the roll and pitch of a ship or aircraft. { ˌstā·bə·lə'zā·shən }

stabilized feedback *See* negative feedback. { 'stā·bəˌlīzd 'fēdˌbak }

stabilizer [CHEM ENG] The fractionation column in a petroleum refinery used to stabilize (remove fractions from) hydrocarbon mixtures. [ENG] **1.** A hardened, splined bushing, sometimes freely rotating, slightly larger than the outer diameter of a core barrel and mounted directly above the core barrel back head. Also known as ferrule; fluted coupling. **2.** A tool located near the bit in the drilling assembly to modify the deviation angle in a well by controlling the location of the contact point between the hole and the drill collars. { 'stā·bəˌlīz·ər }

stabilizer bar [MECH ENG] In an automotive vehicle, a shaft that interconnects the two lower suspension arms in order to reduce body roll when the vehicle is turning. Also known as sway bar. { 'stā·bəˌlīz·ər ˌbär }

stable element [ENG] Any instrument or device, such as a gyroscope, used to stabilize a radar antenna, turret, or other piece of equipment mounted on an aircraft or ship. { 'stā·bəl 'el·ə·mənt }

stable vertical [ENG] Vertical alignment of any device or instrument maintained during motion of the mount. { 'stā·bəl 'vərd·ə·kəl }

stack [BUILD] The portion of a chimney rising above the roof. [CHEM ENG] In gas works, a row of benches containing retorts. [ELECTR] *See* pileup. [ENG] **1.** To stand and rack drill rods in a drill tripod or derrick. **2.** Any structure or part thereof that contains a flue or flues for the discharge of gases. **3.** One or more filter cartridges mounted on a single column. **4.** Tall, vertical conduit (such as smokestack, flue) for venting of combustion or evaporation products or gaseous process wastes. **5.** The exhaust pipe of an internal combustion engine. { stak }

stacked-beam radar [ENG] Three-dimensional radar system that derives elevation by emitting narrow beams stacked vertically to cover a vertical segment, azimuth information from horizontal scanning of the beam, and range information from echo-return time. { 'stakt ˌbēm 'rāˌdär }

stack effect [MECH ENG] The pressure difference between the confined hot gas in a chimney or stack and the cool outside air surrounding the outlet. { 'stak iˌfekt }

stacker [MECH ENG] A machine for lifting merchandise on a platform or fork and arranging it in tiers; operated by hand, or electric or hydraulic mechanisms. { 'stak·ər }

stacker-reclaimer [MECH ENG] Equipment which transports and builds up material stockpiles, and recovers and transports material to processing plants. { 'stak·ər rē'klām·ər }

stack gas [ENG] Gas passed through a chimney. { 'stak ˌgas }

stack pollutants [ENG] Smokestack emissions subject to Environmental Protection Agency standards regulations, including sulfur oxides, particulates, nitrogen oxides, hydrocarbons, carbon monoxide, and photochemical oxidants. { 'stak pəˌlüt·ənts }

stack vent [ENG] An extension to the atmosphere of a waste stack or a soil stack above the highest horizontal branch drain or fixture branch that is connected to the stack. Also known as soil vent; waste vent. { 'stak ˌvent }

stactometer *See* stalagmometer. { stak'täm·əd·ər }

STADAN *See* Space Tracking and Data Acquisition Network. { 'stāˌdan }

stadia [ENG] A surveying instrument consisting of a telescope with special horizontal parallel lines or wires, used in connection with a vertical graduated rod. { 'stād·ē·ə }

stadia hairs [ENG] Two horizontal lines in the reticule of a theodolite arranged symmetrically above and below the line of sight. Also known as stadia wires. { 'stād·ē·ə ˌherz }

stadia rod [ENG] A graduated rod used with a stadia to measure the distance from the observation point to the rod by observation of the length of rod subtended by the distance between the stadia hairs. { 'stād·ē·ə ˌräd }

stadia tables [ENG] Mathematical tables from which may be found, without computation, the horizontal and vertical components of a reading made with a transit and stadia rod. { 'stād·ē·ə ˌtā·bəlz }

stadia wires *See* stadia hairs. { 'stād·ē·ə ˌwīrz }

stadimeter [ENG] An instrument for determining the distance to an object, but its height must be known; the angle subtended by the object's bottom and top as measured at the observer's position is proportional to the object's height; the instrument is graduated directly in distance. { sta'dim·əd·ər }

staff bead [BUILD] **1.** A bead between a wooden frame and adjacent masonry. **2.** A molded or beaded angle of wood or metal set into the corner of plaster walls. { 'staf ˌbēd }

staff gage [ENG] A graduated scale placed in a position so that the stage of a stream may be read directly therefrom; a type of river gage. { 'staf ˌgāj }

stage loader *See* feeder conveyor. { 'stāj ˌlōd·ər }

stagger-tooth cutter [MECH ENG] Side-milling cutter with successive teeth having alternating helix angles. { 'stag·ər ˌtüth ˌkəd·ər }

stained glass [ENG] Glass colored by any of

several means and assembled to produce a varicolored mosaic or representation. { 'stānd 'glas }

stair [CIV ENG] A series of steps between levels or from floor to floor in a building. { ster }

stairway [CIV ENG] One or more flights of stairs connected by landings. { 'ster,wā }

stairwell [BUILD] A vertical compartment that extends through a building to hold a stairway. { 'ster,wel }

stake [ELEC] An iron peg used as a power electrode to transfer current into the ground in electrical prospecting. [ENG] **1.** To fasten back or prop open with a piece of chain or otherwise the valves or clacks of a water barrel in order that the water may run back into the sump when necessary. **2.** A pointed piece of wood driven into the ground to mark a boundary, survey station, or elevation. { stāk }

staking [ENG] Joining two parts together by fitting a projection on one part against a mating feature in the other part and then causing plastic flow at the joint. { 'stāk·iŋ }

staking out [ENG] Driving stakes into the earth to indicate the foundation location of a structure to be built. { 'stāk·iŋ 'au̇t }

stalagmometer [ENG] An instrument for measuring the size of drops suspended from a capillary tube, used in the drop-weight method. Also known as stactometer; stalogometer. { ˌstal·ig'mäm·əd·ər }

stall torque [MECH ENG] The amount of torque provided by a motor at close to zero speed. { 'stȯl ˌtȯrk }

stalogometer *See* stalagmometer. { ˌstal·ə'gäm·əd·ər }

stamper [ENG ACOUS] A negative, generally made of metal by electroforming, used for molding phonograph records. { 'stam·pər }

stamping [ELECTR] A transformer lamination that has been cut out of a strip or sheet of metal by a punch press. [MECH ENG] Almost any press operation including blanking, shearing, hot or cold forming, drawing, bending, and coining. { 'stam·piŋ }

stanchion [ENG] A structural steel member, usually larger than a strut, whose main function is to withstand axial compressive stresses. { 'stan·chən }

standard ballistic conditions [MECH] A set of ballistic conditions arbitrarily assumed as standard for the computation of firing tables. { 'stan·dərd bə'lis·tik kən'dish·ənz }

standard capacitor [ELEC] A capacitor constructed in such a manner that its capacitance value is not likely to vary with temperature and is known to a high degree of accuracy. Also known as capacitance standard. { 'stan·dərd kə'pas·əd·ər }

standard cell [ELEC] A primary cell whose voltage is accurately known and remains sufficiently constant for instrument calibration purposes; the Weston standard cell has a voltage of 1.018636 volts at 20°C. { 'stan·dərd 'sel }

standard elemental time [IND ENG] A standard time for individual work elements. { 'stan·dərd 'el·əˌment·əl 'tīm }

standard evaporator *See* short-tube vertical evaporator. { 'stan·dərd i'vap·əˌrād·ər }

standard fit [DES ENG] A fit whose allowance and tolerance are standardized. { 'stan·dərd 'fit }

standard free-energy increase [THERMO] The increase in Gibbs free energy in a chemical reaction, when both the reactants and the products of the reaction are in their standard states. { 'stan·dərd 'frē ˌen·ər·jē 'inˌkrēs }

standard gage [CIV ENG] A railroad gage measuring 4 feet $8\frac{1}{2}$ inches (1.4351 meters). [DES ENG] A highly accurate gage used only as a standard for working gages. { 'stan·dərd 'gāj }

standard gravity [MECH] A value of the acceleration of gravity equal to 9.80665 meters per second per second. { 'stan·dərd 'grav·əd·ē }

standard heat of formation [THERMO] The heat needed to produce one mole of a compound from its elements in their standard state. { 'stan·dərd 'hēt əv fȯr'mā·shən }

standard hole [DES ENG] A hole with zero allowance plus a specified tolerance; fit allowance is provided for by the shaft in the hole. { 'stan·dərd 'hōl }

standard hour [IND ENG] The quantity of output required of an operator to meet an hourly production quota. Also known as allowed hour. { 'stan·dərd 'au̇r }

standard-hour plan [IND ENG] A wage incentive plan in which standard work times are expressed as standard hours and the worker is paid for standard hours instead of the actual work hours. { 'stan·dərd ˌau̇r 'plan }

standardization [DES ENG] The adoption of generally accepted uniform procedures, dimensions, materials, or parts that directly affect the design of a product or a facility. [ENG] The process of establishing by common agreement engineering criteria, terms, principles, practices, materials, items, processes, and equipment parts and components. { ˌstan·dər·də'zā·shən }

standardized product [DES ENG] A product that conforms to specifications resulting from the same technical requirements. { 'stan·dərˌdīzd 'präd·əkt }

standard leak [ENG] Tracer gas allowed to enter a leak detector at a controlled rate in order to facilitate calibration and adjustment of the detector. { 'stan·dərd 'lēk }

standard load [DES ENG] A load which has been preplanned as to dimensions, weight, and balance, and designated by a number or some classification. { 'stan·dərd 'lōd }

standard noise temperature [ELECTR] The standard reference temperature for noise measurements, equal to 290 K. { 'stan·dərd 'nȯiz ˌtem·prə·chər }

standard output [IND ENG] The reciprocal of standard time. { 'stan·dərd 'au̇tˌpu̇t }

standard performance [IND ENG] The performance of an individual or of a group on meeting standard output. { 'stan·dərd pər'fȯr·məns }

standard shaft [DES ENG] A shaft with zero allowance minus a specified tolerance. { 'stan·dərd 'shaft }

standard time [IND ENG] A unit time value for completion of a work task as determined by the proper application of the appropriate work-measurement techniques. Also known as direct labor standard; output standard; production standard; time standard. { 'stan·dərd 'tīm }

standard ton *See* ton. { 'stan·dərd 'tən }

standard trajectory [MECH] Path through the air that it is calculated a projectile will follow under given conditions of weather, position, and material, including the particular fuse, projectile, and propelling charge that are used; firing tables are based on standard trajectories. { 'stan·dərd trə'jek·trē }

standard wire rope [DES ENG] Wire rope made of six wire strands laid around a sisal core. Also known as hemp-core cable. { 'stan·dərd 'wīr 'rōp }

standby battery [ELEC] A storage battery held in reserve as an emergency power source in event of failure of regular power facilities at a radio station or other location. { 'stand‚bī ‚bad·ə·rē }

standing ways *See* ground ways. { 'stand·iŋ 'wāz }

standpipe [ENG] **1.** A vertical pipe for holding a water supply for fire protection. **2.** A high tank or reservoir for holding water that is used to maintain a uniform pressure in a water-supply system. { 'stand‚pīp }

standpipe system [ENG] A system that contains standpipes, pumps, siamese connections, piping, and equipment with hose outlets and is provided with an adequate supply of water for fire fighting. { 'stan‚pīp ‚sis·təm }

standstill feature [CONT SYS] A device which insures that false signals such as fluctuations in the power supply do not cause a controller to be altered. { 'stan‚stil ‚fē·chər }

Stanton number [THERMO] A dimensionless number used in the study of forced convection, equal to the heat-transfer coefficient of a fluid divided by the product of the specific heat at constant pressure, the fluid density, and the fluid velocity. Symbolized N_{St}. Also known as Margoulis number (M). { 'stant·ən ‚nəm·bər }

staple [DES ENG] A U-shaped loop of wire with points at both ends; used as a fastener. { 'stā·pəl }

stapler [ENG] **1.** A device for inserting wire staples into paper or wood. **2.** A hammer for inserting staples. { 'stā·plər }

star drill [DES ENG] A tool with a star-shaped point, used for drilling in stone or masonry. { 'stär ‚dril }

Stark number *See* Stefan number. { 'stärk ‚nəm·bər }

starling [CIV ENG] A protective enclosure around the pier of a bridge that consists of piles driven close together and is often filled with gravel or stone to protect the pier by serving as a break to water, ice, or drift. { 'stär·liŋ }

starter [ELEC] **1.** A device used to start an electric motor and to accelerate the motor to normal speed. **2.** *See* engine starter. [ELECTR] An auxiliary control electrode used in a gas tube to establish sufficient ionization to reduce the anode breakdown voltage. Also known as trigger electrode. [ENG] A drill used for making the upper part of a hole, the remainder of the hole being made with a drill of smaller gage, known as a follower. { 'stär·dər }

starting barrel [ENG] A short (12 to 24 inches or 30 to 60 centimeters) core barrel used to begin coring operations when the distance between the drill chuck and the bottom of the hole or to the rock surface in which a borehole is to be collared is too short to permit use of a full 5- or 10-foot-long (1.5- or 3.0-meter) core barrel. { 'stärd·iŋ ‚bar·əl }

starting friction *See* static friction. { 'stärd·iŋ ‚frik·shən }

starting resistance [MECH ENG] The force needed to produce an oil film on the journal bearings of a train when it is at a standstill. { 'stärd·iŋ ri‚zis·təns }

starting taper [DES ENG] A slight end taper on a reamer to aid in starting. { 'stärd·iŋ ‚tā·pər }

start time [IND ENG] The calendar time at which the manufacturing work for a specific job begins on a machine or in a facility. { 'stärt ‚tīm }

start-to-leak pressure [MECH ENG] The amount of inlet pressure at which the first bubble occurs at the outlet of a safety relief valve with a resilient disk when the valve is subjected to an air test under a water seal. { 'stärt tə 'lēk ‚presh·ər }

start-up curve [IND ENG] A learning curve applied to a job for the purpose of adjusting work times that are longer than the standard because of the introduction of new jobs or new workers. { 'stärd‚əp ‚kərv }

starved joint [ENG] A glued joint containing insufficient or inadequate adhesive. Also known as hungry joint. { 'stärvd 'jȯint }

state [CONT SYS] A minimum set of numbers which contain enough information about a system's history to enable its future behavior to be computed. { stāt }

state equations [CONT SYS] Equations which express the state of a system and the output of a system at any time as a single valued function of the system's input at the same time and the state of the system at some fixed initial time. { 'stāt i‚kwā·zhənz }

state estimator *See* observer. { 'stāt ‚es·tə‚mād·ər }

state feedback [CONT SYS] A class of feedback control laws in which the control inputs are explicit memoryless functions of the dynamical system state, that is, the control inputs at a given time t_a are determined by the values of the state variables at t_a and do not depend on the values of these variables at earlier times $t \geq t_a$. { 'stāt 'fēd‚bak }

state observer *See* observer. { 'stāt əb‚zər·vər }

state of strain [MECH] A complete description, including the six components of strain, of the deformation within a homogeneously deformed volume. { 'stāt əv 'strān }

state of stress [MECH] A complete description, including the six components of stress, of a homogeneously stressed volume. { 'stāt əv 'stres }

state parameter *See* thermodynamic function of state. { 'stāt pəˌram·əd·ər }

state space [CONT SYS] The set of all possible values of the state vector of a system. { 'stāt ˌspās }

state transition equation [CONT SYS] The equation satisfied by the $n \times n$ state transition matrix $\Phi(t,t_0)$: $\partial\Phi(t,t_0)/\partial t = A(t)\,\Phi(t,t_0)$, $\Phi(t_0,t_0) = I$; here I is the unit $n \times n$ matrix, and $A(t)$ is the $n \times n$ matrix which appears in the vector differential equation $dx(t)/dt = A(t)x(t)$ for the n-component state vector $x(t)$. { 'stāt tranˈzish·ən iˌkwā·zhən }

state transition matrix [CONT SYS] A matrix $\Phi(t,t_0)$ whose product with the state vector x at an initial time t_0 gives the state vector at a later time t; that is, $x(t) = \Phi(t,t_0)x(t_0)$. { 'stāt tranˈzish·ən ˌmā·triks }

state variable [CONT SYS] One of a minimum set of numbers which contain enough information about a system's history to enable computation of its future behavior. *See* thermodynamic function of state. { 'stāt ˌver·ē·ə·bəl }

state vector [CONT SYS] A column vector whose components are the state variables of a system. { 'stāt ˌvek·tər }

statically admissible loads [MECH] Any set of external loads and internal forces which fulfills conditions necessary to maintain the equilibrium of a mechanical system. { 'stad·ik·əl·ē əd'mis·ə·bəl 'lōdz }

static bed [CHEM ENG] A layer of solids in a process vessel (absorber, catalytic reactor, packed distillation column, or granular filter bed) in which the particles rest upon one another at essentially the settled bulk density of the solids phase; contrasted to moving-solids or fluidized-solids beds. { 'stad·ik 'bed }

static charge [ELEC] An electric charge accumulated on an object. { 'stad·ik 'chärj }

static discharger [ELEC] A rubber-covered cloth wick about 6 inches (15 centimeters) long, sometimes attached to the trailing edges of the surfaces of an aircraft to discharge static electricity in flight. { 'stad·ik 'disˌchär·jər }

static electricity [ELEC] **1.** The study of the effects of macroscopic charges, including the transfer of a static charge from one object to another by actual contact or by means of a spark that bridges an air gap between the objects. **2.** *See* electrostatics. { 'stad·ik iˌiˌlek'tris·əd·ē }

static equilibrium *See* equilibrium. { 'stad·ik ˌē·kwə'lib·rē·əm }

static friction [MECH] **1.** The force that resists the initiation of sliding motion of one body over the other with which it is in contact. **2.** The force required to move one of the bodies when they are at rest. Also known as limiting friction; starting friction. { 'stad·ik 'frik·shən }

static load [MECH] A nonvarying load; the basal pressure exerted by the weight of a mass at rest, such as the load imposed on a drill bit by the weight of the drill-stem equipment or the pressure exerted on the rocks around an underground opening by the weight of the superimposed rocks. Also known as dead load. { 'stad·ik 'lōd }

static moment [MECH] **1.** A scalar quantity (such as area or mass) multiplied by the perpendicular distance from a point connected with the quantity (such as the centroid of the area or the center of mass) to a reference axis. **2.** The magnitude of some vector (such as force, momentum, or a directed line segment) multiplied by the length of a perpendicular dropped from the line of action of the vector to a reference point. { 'stad·ik 'mō·mənt }

static-pressure tap *See* pressure tap. { 'stad·ik ˈpresh·ər ˌtap }

static-pressure tube [ENG] A smooth tube with a rounded nose that has radial holes in the portion behind the nose and is used to measure the static pressure within the flow of a fluid. { 'stad·ik ˈpresh·ər ˌtüb }

static reaction [MECH] The force exerted on a body by other bodies which are keeping it in equilibrium. { 'stad·ik rē'ak·shən }

statics [MECH] The branch of mechanics which treats of force and force systems abstracted from matter, and of forces which act on bodies in equilibrium. { 'stad·iks }

static seal *See* gasket. { 'stad·ik 'sēl }

static test [ENG] A measurement taken under conditions where neither the stimulus nor the environmental conditions fluctuate. { 'stad·ik 'test }

static tube [ENG] A device used to measure the static (not kinetic or total) pressure in a stream of fluid; consists of a perforated, tapered tube that is placed parallel to the flow, and has a branch tube that is connected to a manometer. { 'stad·ik ˌtüb }

station [ELEC] An assembly line or assembly machine location at which a wiring board or chassis is stopped for insertion of one or more parts. [ELECTR] A location at which radio, television, radar, or other electric equipment is installed. [ENG] Any predetermined point or area on the seas or oceans which is patrolled by naval vessels. { stā·shən }

stationary cone classifier [MECH ENG] In a pulverizer directly feeding a coal furnace, a device which returns oversize coal to the pulverizing zone. { 'stā·shəˌner·ē ˈkōn 'klas·əˌfī·ər }

stationary engine [MECH ENG] A permanently placed engine, as in a power house, factory, or mine. { 'stā·shəˌner·ē 'en·jən }

station pole [CIV ENG] One of various rods used in surveying to mark stations, to sight points and lines; or to measure elevation with respect to the transit. { 'stā·shən ˌpōl }

station roof [BUILD] **1.** A roof supported by a

single central post and having a shape that resembles an umbrella. Also known as umbrella roof. **2.** A long roof supported by a single row of posts and by cantilevers on one or both sides; typically used for railroad platforms. { 'stā·shən ˌrüf }

statistical multiplexer [ELECTR] A device which combines several low-speed communications channels into a single high-speed channel, and which can manage more communications traffic than a standard multiplexer by analyzing traffic and choosing different transmission patterns. { stə'tis·tə·kəl 'məl·təˌplek·sər }

statistical quality control [IND ENG] The use of statistical techniques as a means of controlling the quality of a product or process. { stə'tis·tə·kəl 'kwäl·əd·ē kənˌtrōl }

stator [ELEC] The portion of a rotating machine that contains the stationary parts of the magnetic circuit and their associated windings. [MECH ENG] A stationary machine part in or about which a rotor turns. { 'stād·ər }

statoscope [ENG] **1.** A barometer that records small variations in atmospheric pressure. **2.** An instrument that indicates small changes in an aircraft's altitude. { 'stad·əˌskōp }

statute mile *See* mile. { 'stach·üt 'mīl }

stave [DES ENG] **1.** A rung of a ladder. **2.** Any of the narrow wooden strips or metal plates placed edge to edge to form the sides, top, or lining of a vessel or structure, such as a barrel. { stāv }

stay [ENG] In a structure, a tensile member which holds other members of the structure rigidly in position. { stā }

staybolt [DES ENG] A bolt with a thread along the entire length of the shaft; used to attach machine parts that are under pressure to separate. { 'stāˌbōlt }

stayed-cable bridge [CIV ENG] A modified cantilever bridge consisting of girders or trusses cantilevered both ways from a central tower and supported by inclined cables attached to the tower at the top or sometimes at several levels. { 'stād ˌkā·bəl ˌbrij }

STD recorder *See* salinity-temperature-depth recorder. { ˌes,tē'dē riˌkȯrd·ər }

steadiness [CONT SYS] Freedom of a robot arm or end effector from high-frequency vibrations and jerks. { 'sted·ē·nəs }

steady pin [ENG] **1.** A retaining device such as a dowel, pin, or key that prevents a pulley from turning on its axis. **2.** A guide pin used to lift a cope or pattern. { 'sted·ē ˌpin }

steady rest [MECH ENG] A device that is used to support long, slender workpieces during turning or grinding and permits them to rotate without eccentric movement. { 'sted·ē ˌrest }

steady-state conduction [THERMO] Heat conduction in which the temperature and heat flow at each point does not change with time. { 'sted·ē ˌstāt kən'dək·shən }

steady-state creep *See* secondary creep. { 'sted·ē ˌstāt 'krēp }

steady-state error [CONT SYS] The error that remains after transient conditions have disappeared in a control system. { 'sted·ē ˌstāt 'er·ər }

steady-state flow [CHEM ENG] Fluid flow without any change in composition or phase equilibria relationships. { 'sted·ē ˌstāt 'flō }

steady-state vibration [MECH] Vibration in which the velocity of each particle in the system is a continuous periodic quantity. { 'sted·ē ˌstāt vī'brā·shən }

steam accumulator [MECH ENG] A pressure vessel in which water is heated by steam during off-peak demand periods and regenerated as steam when needed. { 'stēm ə'kyü·məˌlād·ər }

steam atomizing oil burner [ENG] A burner which has two supply lines, one for oil and the other for a jet of steam which assists in the atomization process. { 'stēm ˌad·əˌmīz·iŋ 'ȯil ˌbər·nər }

steam attemperation [MECH ENG] The control of the maximum temperature of superheated steam by water injection or submerged cooling. { 'stēm əˌtəm·pə'rā·shən }

steam bending [ENG] Forming wooden members to a desired shape by pressure after first softening by heat and moisture. { 'stēm ˌbend·iŋ }

steam boiler [MECH ENG] A pressurized system in which water is vaporized to steam by heat transferred from a source of higher temperature, usually the products of combustion from burning fuels. Also known as steam generator. { 'stēm ˌbȯi·lər }

steam calorimeter [ENG] **1.** A calorimeter, such as the Joly or differential steam calorimeter, in which the mass of steam condensed on a body is used to calculate the amount of heat supplied. **2.** *See* throttling calorimeter. { 'stēm ˌkal·ə'rim·əd·ər }

steam cock [ENG] A valve for the passage of steam. { 'stēm ˌkäk }

steam condenser [MECH ENG] A device to maintain vacuum conditions on the exhaust of a steam prime mover by transfer of heat to circulating water or air at the lowest ambient temperature. { 'stēm kənˌden·sər }

steam cracking [CHEM ENG] High-temperature cracking of petroleum hydrocarbons in the presence of steam. { 'stēm 'krak·iŋ }

steam cure [ENG] To cure concrete or mortar in water vapor at an elevated temperature, at either atmospheric or high pressure. { 'stēm ˌkyůr }

steam cycle *See* Rankine cycle. { 'stēm ˌsī·kəl }

steam distillation [CHEM ENG] A distillation in which vaporization of the volatile constituents of a liquid mixture takes place at a lower temperature by the introduction of steam directly into the charge; steam used in this manner is known as open steam. Also known as steam stripping. { 'stēm ˌdis·tə'lā·shən }

steam drive [MECH ENG] Any device which uses power generated by the pressure of expanding steam to move a machine or a machine part. { 'stēm ˌdrīv }

steam dryer [MECH ENG] A device for separating liquid from vapor in a steam supply system. { 'stēm ˌdrī·ər }

steam emulsion test [ENG] A test used for measuring the ability of oil and water to separate, especially for steam-turbine oil; after emulsification and separation, the time required for the emulsion to be reduced to 3 milliliters or less is recorded at 5-minute intervals. { 'stēm i'məl·shən ˌtest }

steam engine [MECH ENG] A thermodynamic device for the conversion of heat in steam into work, generally in the form of a positive displacement, piston and cylinder mechanism. { 'stēm ¦en·jən }

steam engine indicator [ENG] An instrument that plots the steam pressure in an engine cylinder as a function of piston displacement. { 'stēm ¦en·jən 'in·dəˌkād·ər }

steam gage [ENG] A device for measuring steam pressure. { 'stēm ˌgāj }

steam-generating furnace *See* boiler furnace. { 'stēm ¦jen·əˌrād·iŋ ˌfər·nəs }

steam generator *See* steam boiler. { 'stēm ¦jen·əˌrād·ər }

steam hammer [MECH ENG] A forging hammer in which the ram is raised, lowered, and operated by a steam cylinder. { 'stēm ˌham·ər }

steam-heated evaporator [MECH ENG] A structure using condensing steam as a heat source on one side of a heat-exchange surface to evaporate liquid from the other side. { 'stēm ¦hēd·əd i'vap·əˌrād·ər }

steam heating [MECH ENG] A system that used steam as the medium for a comfort or process heating operation. { 'stēm 'hēd·iŋ }

steam jacket [MECH ENG] A casing applied to the cylinders and heads of a steam engine, or other space, to keep the surfaces hot and dry. { 'stēm ˌjak·ət }

steam jet [ENG] A blast of steam issuing from a nozzle. { 'stēm ˌjet }

steam-jet cycle [MECH ENG] A refrigeration cycle in which water is used as the refrigerant; high-velocity steam jets provide a high vacuum in the evaporator, causing the water to boil at low temperature and at the same time compressing the flashed vapor up to the condenser pressure level. { 'stēm ¦jet ˌsī·kəl }

steam-jet ejector [MECH ENG] A fluid acceleration vacuum pump or compressor using the high velocity of a steam jet for entrainment. { 'stēm ¦jet i'jek·tər }

steam line [THERMO] A graph of the boiling point of water as a function of pressure. { 'stēm ˌlīn }

steam locomotive [MECH ENG] A railway propulsion power plant using steam, generally in a reciprocating, noncondensing engine. { 'stēm ˌlō·kəˈmōd·iv }

steam loop [ENG] Two vertical pipes connected by a horizontal one, used to condense boiler steam so that it can be returned to the boiler without a pump or injector. { 'stēm ˌlüp }

steam molding [ENG] The use of steam, either directly on the material or indirectly on the mold surfaces, as a heat source to mold parts from preexpanded polystyrene beads. { 'stēm ˌmōld·iŋ }

steam nozzle [MECH ENG] A streamlined flow structure in which heat energy of steam is converted to the kinetic form. { 'stēm ˌnäz·əl }

steam point [THERMO] The boiling point of pure water whose isotopic composition is the same as that of sea water at standard atmospheric pressure; it is assigned a value of 100°C on the International Practical Temperature Scale of 1968. { 'stēm ˌpȯint }

steam pump [MECH ENG] A pump driven by steam acting on the coupled piston rod and plunger. { 'stēm ˌpəmp }

steam purifier *See* steam separator. { 'stēm 'pyùr·əˌfī·ər }

steam refining [CHEM ENG] A petroleum refinery distillation process, in which the only heat used comes from steam in open and closed coils near the bottom of the still; used to produce gasoline and naphthas where odor and color are of prime importance; where open steam is used, it is known as steam distillation. { 'stēm ri'fīn·iŋ }

steam reheater [MECH ENG] A steam boiler component in which heat is added to intermediate-pressure steam, which has given up some of its energy in expansion through the high-pressure turbine. { 'stēm rēˌhēd·ər }

steam roller [MECH ENG] A road roller driven by a steam engine. { 'stēm ˌrō·lər }

steam separator [MECH ENG] A device for separating a mixture of the liquid and vapor phases of water. Also known as steam purifier. { 'stēm 'sep·əˌrād·ər }

steam shovel [MECH ENG] A power shovel operated by steam. { 'stēm ˌshəv·əl }

steam still [CHEM ENG] A still in which steam provides most of the heat; distillation requires a lower temperature than in standard equipment (except for a vacuum distillation unit). { 'stēm ˌstil }

steam stripping *See* steam distillation. { 'stēm 'strip·iŋ }

steam superheater [MECH ENG] A boiler component in which sensible heat is added to the steam after it has been evaporated from the liquid phase. { 'stēm 'sü·pərˌhēd·ər }

steam tracing [ENG] A steam-carrying heater (such as tubing or piping) next to or twisted around a process-fluid or instrument-air line; used to keep liquids from solidifying or condensing. { 'stēm ˌtrās·iŋ }

steam trap [MECH ENG] A device which drains and removes condensate automatically from steam lines. { 'stēm ˌtrap }

steam-tube dryer [MECH ENG] Rotary dryer with steam-heated tubes running the full length of the cylinder and rotating with the dryer shell. { 'stēm ¦tüb ˌdrī·ər }

steam turbine [MECH ENG] A prime mover for the conversion of heat energy of steam into work on a rotating shaft, utilizing fluid acceleration

principles in jet and vane machinery. { 'stēm ˌtər·bən }

steam valve [ENG] A valve used to regulate the flow of steam. { 'stēm ˌvalv }

steam washer [ENG] A device for removing contaminants, such as silica, from the steam produced in a boiler. { 'stēm ˌwäsh·ər }

steel-cable conveyor belt [DES ENG] A rubber conveyor belt in which the carcass is composed of a single plane of steel cables. { 'stēl ˈkā·bəl kənˈvā·ər ˌbelt }

steel-clad rope [DES ENG] A wire rope made from flat strips of steel wound helically around each of the six strands composing the rope. { 'stēl ˈklad 'rōp }

Steelflex coupling [MECH ENG] A flexible coupling made with two grooved steel hubs keyed to their respective shafts and connected by a specially tempered alloy-steel member called the grid. { 'stēlˌfleks 'kəp·liŋ }

steelyard [ENG] A weighing device with a counterbalanced arm supporting the load to be weighed on the short end. { 'stil·yərd }

steen [CIV ENG] To line an excavation such as a cellar or well with stone, cement, or similar material without the use of mortar. { stēn }

steering arm [MECH ENG] An arm that transmits turning motion from the steering wheel of an automotive vehicle to the drag link. { 'stir·iŋ ˌärm }

steering brake [MECH ENG] Means of turning, stopping, or holding a tracked vehicle by braking the tracks individually. { 'stir·iŋ ˌbrāk }

steering gear [MECH ENG] The mechanism, including gear train and linkage, for the directional control of a vehicle or ship. { 'stir·iŋ ˌgir }

steering wheel [MECH ENG] A hand-operated wheel for controlling the direction of the wheels of an automotive vehicle or of the rudder of a ship. { 'stir·iŋ ˌwēl }

Stefan number [THERMO] A dimensionless number used in the study of radiant heat transfer, equal to the Stefan-Boltzmann constant times the cube of the temperature times the thickness of a layer divided by the layer's thermal conductivity. Symbolized *St*. Also known as Stark number (*Sk*). { 'shteˌfän ˌnəm·bər }

Steiner's theorem *See* parallel axis theorem. { 'shtīn·ərz ˌthir·əm }

stem [ENG] **1.** The heavy iron rod acting as the connecting link between the bit and the balance of the string of tools on a churn rod. **2.** To insert packing or tamping material in a shothole. { stem }

stem correction [THERMO] A correction which must be made in reading a thermometer in which part of the stem, and the thermometric fluid within it, is at a temperature which differs from the temperature being measured. { 'stem kəˌrek·shən }

stemming rod [ENG] A nonmetallic rod used to push explosive cartridges into position in a shothole and to ram tight the stemming. { 'stem·iŋ ˌräd }

stem-winding [MECH ENG] Pertaining to a timepiece that is wound by an internal mechanism turned by an external knob and stem (the winding button of a watch). { 'stem ˈwīnd·iŋ }

stenometer [ENG] An instrument for measuring distances; employs a telescope in which two target images a known distance apart are superimposed by turning a micrometer screw. { stə 'näm·əd·ər }

step [ENG] A small offset on a piece of core or in a drill hole resulting from a sudden sidewise deviation of the bit as it enters a hard, tilted stratum or rock underlying a softer rock. { step }

step aeration [CIV ENG] An activated sludge process in which the settled sewage is introduced into the aeration tank at more than one point. { 'step eˌrā·shən }

step bearing [MECH ENG] A device which supports the bottom end of a vertical shaft. Also known as pivot bearing. { 'step ˌber·iŋ }

step block [ENG] A metal block, usually of steel or cast iron, with integral stepped sections to allow application of clamps when securing a workpiece to a machine tool table. { 'step ˌbläk }

step-by-step system [CONT SYS] A control system in which the drive motor moves in discrete steps when the input element is moved continuously. { ˈstep bī ˈstep 'sis·təm }

step gage [DES ENG] **1.** A plug gage containing several cylindrical gages of increasing diameter mounted on the same axis. **2.** A gage consisting of a body in which a blade slides perpendicularly; used to measure steps and shoulders. { 'step ˌgāj }

stepped cone pulley [DES ENG] A one-piece pulley with several diameters to engage transmission belts and thereby provide different speed ratios. { 'stept ˈkōn 'půl·ē }

stepped footing [CIV ENG] A widening at the bottom of a wall consisting of a series of steps in the proportion of one horizontal to two vertical units. { 'stept 'fůd·iŋ }

stepped gear wheel [DES ENG] A gear wheel containing two or more sets of teeth on the same rim, with adjacent sets slightly displaced to form a series of steps. { 'stept 'gir ˌwēl }

stepped screw [DES ENG] A screw from which sectors have been removed, the remaining screw surfaces forming steps. { 'stept 'skrü }

stepper motor [ELEC] A motor that rotates in short and essentially uniform angular movements rather than continuously; typical steps are 30, 45, and 90°; the angular steps are obtained electromagnetically rather than by the ratchet and pawl mechanisms of stepping relays. Also known as magnetic stepping motor; stepping motor; step-servo motor. { 'step·ər ˌmōd·ər }

stepping *See* zoning. { 'step·iŋ }

stepping motor *See* stepper motor. { 'step·iŋ ˌmōd·ər }

step pulley [MECH ENG] A series of pulleys of various diameters combined in a single concentric unit and used to vary the velocity ratio of shafts. Also known as cone pulley. { 'step ˌpůl·ē }

step-recovery diode [ELECTR] A varactor in which forward voltage injects carriers across the junction, but before the carriers can combine, voltage reverses and carriers return to their origin in a group; the result is abrupt cessation of reverse current and a harmonic-rich waveform. { 'step ri¦kəv·rē 'dī,ōd }

step response [CONT SYS] The behavior of a system when its input signal is zero before a certain time and is equal to a constant nonzero value after this time. { 'step ri,spdäns }

step-up transformer [ELEC] Transformer in which the energy transfer is from a low-voltage winding to a high-voltage winding or windings. { 'step¦əp tranz,fȯr·mər }

step voltage regulator [ELEC] A type of voltage regulator used on distribution feeder lines; it provides increments or steps of voltage change. { 'step 'vōl·tij ˌreg·yəˌlād·ər }

stère [MECH] A unit of volume equal to 1 cubic meter; it is used mainly in France, and in measuring timber volumes. { stir }

stereo *See* stereophonic; stereo sound system. { 'ste·rē·ō }

stereo amplifier [ENG ACOUS] An audio-frequency amplifier having two or more channels, as required for use in a stereo sound system. { 'ste·rē·ō 'am·pləˌfī·ər }

stereolithography [IND ENG] A three-dimensional printing process whereby a CAD drawing of a part is processed to create a file of the part in slices and the part is constructed one slice (or layer) at a time (from bottom to top) by depositing layer upon layer of material (usually a liquid resin that can be hardened using a scanning laser), used for rapid prototyping. { ˌster·ē·ō·li'thäg·rə·fē }

stereomicrometer [ENG] An instrument attached to an optical instrument (such as a telescope) to measure small angles. { ¦ster·ē·ə·mī'kräm·əd·ər }

stereophonic [ENG ACOUS] Pertaining to three-dimensional pickup or reproduction of sound, as achieved by using two or more separate audio channels. Also known as stereo. { ¦ster·ē·ə 'fän·ik }

stereophonics [ENG ACOUS] The study of reproducing or reinforcing sound in such a way as to produce the sensation that the sound is coming from sources whose spatial distribution is similar to that of the original sound sources. { ¦ster·ē·ə'fän·iks }

stereophonic sound system *See* stereo sound system. { ¦ster·ē·ə'fan·ik 'saůnd ˌsis·təm }

stereo pickup [ENG ACOUS] A phonograph pickup designed for use with standard single-groove two-channel stereo records; the pickup cartridge has a single stylus that actuates two elements, one responding to stylus motion at 45° to the right of vertical and the other responding to stylus motion at 45° to the left of vertical. { 'ster·ē·ō 'pikˌəp }

stereoplanigraph [ENG] An instrument for drawing topographic maps from observations of stereoscopic aerial photographs with a stereocomparator. { ¦ster·ē·ə'planˌəˌgraf }

stereo preamplifier [ENG ACOUS] An audio-frequency preamplifier having two channels, used in a stereo sound system. { 'ster·ē·ō ¦prē'am·pləˌfī·ər }

stereo record [ENG ACOUS] A single-groove disk record having V-shaped grooves at 45° to the vertical; each groove wall has one of the two recorded channels. { 'ster·ē·ō 'rek·ərd }

stereo recorded tape [ENG ACOUS] Recorded magnetic tape having two separate recordings, one for each channel of a stereo sound system. { 'ster·ē·ō ri¦kȯrd·əd 'tāp }

stereo sound system [ENG ACOUS] A sound reproducing system in which a stereo pickup, stereo tape recorder, stereo tuner, or stereo microphone system feeds two independent audio channels, each of which terminates in one or more loudspeakers arranged to give listeners the same audio perspective that they would get at the original sound source. Also known as stereo; stereophonic sound system. { 'ster·ē·ō 'saůnd ˌsis·təm }

stereo tape recorder [ENG ACOUS] A magnetic-tape recorder having two stacked playback heads, used for reproduction of stereo recorded tape. { 'ster·ē·ō 'tāp riˌkȯrd·ər }

stereo tuner [ENG ACOUS] A tuner having provisions for receiving both channels of a stereo broadcast. { 'ster·ē·ō 'tün·ər }

sterhydraulic [MECH ENG] Pertaining to a hydraulic press in which motion or pressure is produced by the introduction of a solid body into a cylinder filled with liquid. { ¦ster·hī'drȯl·ik }

sterilizer [ENG] An apparatus for sterilizing by dry heat, steam, or water. { 'ster·əˌlīz·ər }

sthène [MECH] The force which, when applied to a body whose mass is 1 metric ton, results in an acceleration of 1 meter per second per second; equal to 1000 newtons. Formerly known as funal. { sthēn }

stick [ENG] **1.** A rigid bar hinged to the boom of a dipper or pull shovel and fastened to the bucket. **2.** A long slender tool bonded with an abrasive for honing or sharpening tools and for dressing of wheels. { stik }

stick gage [ENG] A suitably divided vertical rod, or stick, anchored in an open vessel so that the magnitude of rise and fall of the liquid level may be observed directly. { 'stik ˌgāj }

stick-slip friction [MECH] Friction between two surfaces that are alternately at rest and in motion with respect to each other. { 'stik ˌslip ˌfrik·shən }

stiction [MECH] Friction that tends to prevent relative motion between two movable parts at their null position. { 'stik·shən }

stiffener [CIV ENG] A steel angle or plate attached to a slender beam to prevent its buckling by increasing its stiffness. { 'stif·nər }

stiffleg derrick [MECH ENG] A derrick consisting of a mast held in the vertical position by a fixed tripod of steel or timber legs. Also

known as derrick crane; Scotch derrick. { 'stif ˌleg 'der·ik }

stiffness [MECH] The ratio of a steady force acting on a deformable elastic medium to the resulting displacement. { 'stif·nəs }

stiffness coefficient [MECH] The ratio of the force acting on a linear mechanical system, such as a spring, to its displacement from equilibrium. { 'stif·nəs ˌkō·iˌfish·ənt }

stiffness constant [MECH] Any one of the coefficients of the relations in the generalized Hooke's law used to express stress components as linear functions of the strain components. Also known as elastic constant. { 'stif·nəs ˌkän·stənt }

stiffness matrix [MECH] A matrix $\mathbf{K}$ used to express the potential energy V of a mechanical system during small displacements from an equilibrium position, by means of the equation $V = 1/2\mathbf{q}^{T}\mathbf{K}\mathbf{q}$, where $\mathbf{q}$ is the vector whose components are the generalized components of the system with respect to time and $\mathbf{q}^{T}$ is the transpose of $\mathbf{q}$. Also known as stability matrix. { 'stif·nəs ˌmā·triks }

stigma [MECH] A unit of length used mainly in nuclear measurements, equal to 10^{-12} meter. Also known as bicron. { 'stig·mə }

stile [BUILD] The upright outside framing piece of a window or door. { stīl }

still [CHEM ENG] A device used to evaporate liquids; heat is applied to the liquid, and the resulting vapor is condensed to a liquid state. { stil }

stilling basin [ENG] A depressed area in a channel or reservoir that is deep enough to reduce the velocity of the flow. Also known as stilling box. { 'stil·iŋ ˌbas·ən }

stilling box *See* stilling basin. { 'stil·iŋ ˌbäks }

stimulus [CONT SYS] A signal that affects the controlled variable in a control system. { 'stim·yə·ləs }

Stirling cycle [THERMO] A regenerative thermodynamic power cycle using two isothermal and two constant volume phases. { 'stir·liŋ ˌsī·kəl }

Stirling engine [MECH ENG] An engine in which work is performed by the expansion of a gas at high temperature; heat for the expansion is supplied through the wall of the piston cylinder. { 'stir·liŋ ˌen·jən }

stirred-flow reactor [CHEM ENG] A reactor in which there is a device for achieving effective mixing, frequently in the form of a rapidly rotating basket holding the catalyst. { ¦stird 'flō rēˌak·tər }

stirrup [CIV ENG] In concrete construction, a U-shaped bar which is anchored perpendicular to the longitudinal steel as reinforcement to resist shear. { 'stər·əp }

stitch bonding [ENG] A method of making wire connections between two or more points on an integrated circuit by using impulse welding or heat and pressure while feeding the connecting wire through a hole in the center of the welding electrode. { 'stich ˌbänd·iŋ }

stitching [ENG] Progressive welding of thermoplastic materials (resins) by successive applications of two small, mechanically operated, radio-frequency-heated electrodes; the mechanism is similar to that of a normal sewing machine. { 'stich·iŋ }

stitch rivet [ENG] One of a series of rivets joining the parallel elements of a structural member so that they act as a unit. { 'stich ˌriv·ət }

stochastic control theory [CONT SYS] A branch of control theory that aims at predicting and minimizing the magnitudes and limits of the random deviations of a control system through optimizing the design of the controller. { stō'kas·tik kən'trōl ˌthē·ə·rē }

stock [IND ENG] **1.** A product or material kept in storage until needed for use or transferred to some ultimate point for use, for example, crude oil tankage or paper-pulp feed. **2.** Designation of a particular material, such as bright stock or naphtha stock. { stäk }

stock accounting [IND ENG] The establishment and maintenance of formal records of material in stock reflecting such information as quantities, values, or condition. { 'stäk əˌkaůnt·iŋ }

stock control [IND ENG] Process of maintaining inventory data on the quantity, location, and condition of supplies and equipment due in, on hand, and due out, to determine quantities of material and equipment available or required for issue and to facilitate distribution and management of material. { 'stäk kənˌtrōl }

stock coordination [IND ENG] A supply management function exercised usually at department level which controls the assignment of material cognizance for items or categories of material to inventory managers. { 'stäk kōˌȯrd·ənˌā·shən }

stocking cutter [MECH ENG] **1.** A gear cutter having side rake or curved edges to rough out the gear-tooth spaces before they are formed by the regular gear cutter. **2.** A concave gear cutter ganged beside a regular gear cutter and used to finish the periphery of a gear blank by milling ahead of the regular cutter. { 'stäk·iŋ ¦kəd·ər }

stock number [IND ENG] Number assigned to an item, principally to identify that item for storage and issue purposes. { 'stäk ˌnəm·bər }

stockpile [ENG] A reserve stock of material, equipment, raw material, or other supplies. { 'stäkˌpīl }

stock rail [CIV ENG] The fixed rail in a track, against which the switch rail operates. { 'stäk ˌrāl }

stock record account [IND ENG] A basic record showing by item the receipt and issuance of property, the balances on hand, and such other identifying or stock control data as may be required by proper authority. { 'stäk ¦rek·ərd əˌkaůnt }

Stodola method [MECH] A method of calculating the deflection of a uniform or nonuniform beam in free transverse vibration at a specified frequency, as a function of distance along the beam, in which one calculates a sequence of

deflection curves each of which is the deflection resulting from the loading corresponding to the previous deflection, and these deflections converge to the solution. { 'stō·də·lə ˌmeth·əd }

stoker [MECH ENG] A mechanical means, as used in a furnace, for feeding coal, removing refuse, controlling air supply, and mixing with combustibles for efficient burning. { 'stō·kər }

Stokes number 2 [ENG] A dimensionless number used in the calibration of rotameters, equal to 1.042 $m_f g\rho\,(1 - \rho/\rho_f)R^3/\mu^2$, where ρ and μ are the density and dynamic viscosity of the fluid respectively, m_f and ρ_f are the mass and density of the float respectively, and R is the ratio of the radius of the tube to the radius of the float. Symbol St_2. { 'stōks ˌnəm·bər 'tü }

stone [MECH] A unit of mass in common use in the United Kingdom, equal to 14 pounds or 6.35029318 kilograms. { stōn }

stonework [CIV ENG] A structure or the part of a structure built of stone. { 'stōnˌwərk }

Stoney gate [CIV ENG] A crest gate which moves along a series of rollers traveling vertically in grooves in masonry piers, independently of the gate and piers. { 'stō·nē ˌgāt }

stop [CONT SYS] A bound or final position of a robot's movement. { stäp }

stop and stay *See* absolute stop. { 'stäp ən 'stā }

stop bead [BUILD] A molding on the pulley stile of a window frame; forms one side of the groove for the inner sash. { 'stäp ˌbēd }

stop cock [ENG] A small valve for stopping or regulating the flow of a fluid through a pipe. { 'stäp ˌkäk }

stoplog [CIV ENG] A log, plank, or steel or concrete beam that fits into a groove or rack between walls or piers to prevent the flow of water through an opening in a dam, conduit, or other channel. { 'stäpˌläg }

stop nut [DES ENG] **1.** An adjustable nut that restricts the travel of an adjusting screw. **2.** A nut with a compressible insert that binds it so that a lock washer is not needed. { 'stäp ˌnət }

stopping capacitor *See* coupling capacitor. { 'stäp·iŋ kəˌpas·əd·ər }

stop valve [ENG] A valve that can be opened or closed to regulate or stop the flow of fluid in a pipe. { 'stäp ˌvalv }

storage battery [ELEC] A connected group of two or more storage cells or a single storage cell. Also known as accumulator; accumulator battery; rechargeable battery; secondary battery. { 'stȯr·ij ˌbad·ə·rē }

storage calorifier *See* cylinder. { 'stȯr·ij kə'lȯr·əˌfī·ər }

storage cell [ELEC] An electrolytic cell for generating electric energy, in which the cell after being discharged may be restored to a charged condition by sending a current through it in a direction opposite to that of the discharging current. Also known as secondary cell. { 'stȯr·ij ˌsel }

storage reservoir *See* impounding reservoir. { 'stȯr·ij ˌrez·əvˌwär }

storage-retrieval machine [CONT SYS] A computer-controlled machine for an automated storage and retrieval system that operates on rails and moves material either vertically or horizontally between a storage compartment and a transfer station. { ¦stȯr·ij ri'trēv·əl məˌshēn }

stored-program numerical control *See* computer numerical control. { 'stȯrd ¦prōˌgram nü'mer·ə·kəl kənˌtrōl }

storm cellar *See* cyclone cellar. { 'stȯrm ˌsel·ər }

storm drain [CIV ENG] A drain which conducts storm surface, or wash water, or drainage after a heavy rain from a building to a storm or a combined sewer. Also known as storm sewer. { 'stȯrm ˌdrān }

storm sash *See* storm window. { 'stȯrm ˌsash }

storm sewage [CIV ENG] Refuse liquids and waste carried by sewers during or following a period of heavy rainfall. { 'stȯrm ˌsü·ij }

storm sewer *See* storm drain. { 'stȯrm ˌsü·ər }

storm window [BUILD] A sash placed on the outside of an ordinary window to give added protection from the weather. Also known as storm sash. { 'stȯrm ˌwin·dō }

Storrow whirling hygrometer [ENG] A hygrometer in which the two thermometers are mounted side by side on a brass frame and fitted with a loose handle so that it can be whirled in the atmosphere to be tested; the instrument is whirled at some 200 revolutions per minute for about 1 minute and the readings on the wet- and dry-bulb thermometers are recorded; used in conjunction with Glaisher's or Marvin's hygrometrical tables. { 'stä·rō 'wərl·iŋ hī'gräm·əd·ər }

story [BUILD] The space between two floors or between a floor and the roof. { stȯr·ē }

story pole *See* story rod. { 'stȯr·ē ˌpōl }

story rod [DES ENG] A pole cut to the exact specified height from finished floor to ceiling and used as a measuring device in the course of construction. Also known as story pole. { 'stȯr·ē ˌräd }

stove [ENG] A chamber within which a fuel-air mixture is burned to provide heat, the heat itself being radiated outward from the chamber; used for space heating, process-fluid heating, and steel blast furnaces. { stōv }

stove bolt [DES ENG] A coarsely threaded bolt with a slotted head, which with a square nut is used to join metal parts. { 'stōv ˌbōlt }

stovepipe [ENG] Large-diameter pipe made of sheet steel. { 'stōvˌpīp }

stoving *See* baking. { 'stōv·iŋ }

STR *See* self-tuning regulator.

straddle milling [MECH ENG] Face milling of two parallel vertical surfaces of a workpiece simultaneously by using two side-milling cutters. { 'strad·əl ˌmil·iŋ }

straddle truck [MECH ENG] A self-loading outrigger type of industrial truck that straddles the load before lifting it between the outrigger arms. { 'strad·əl ˌtrək }

straight beam [ENG] In ultrasonic testing, a longitudinal wave emitted from an ultrasonic

search unit in a wavetrain which travels perpendicularly to the test surface. { 'strāt 'bēm }

straight bevel gear [DES ENG] A simple form of bevel gear having straight teeth which, if extended inward, would come together at the intersection of the shaft axes. { 'strāt 'bev·əl ˌgir }

straightedge [DES ENG] A strip of wood, plastic, or metal with one or more long edges made straight with a desired degree of accuracy. { 'strādˌej }

straightening vanes [ENG] Horizontal vanes mounted on the inside of fluid conduits to reduce the swirling or turbulent flow ahead of the orifice or the venturi meters. { 'strāt·ən·iŋ ˌvānz }

straight filing [ENG] Filing by pushing a file in a straight line across the work. { 'strāt 'fīl·iŋ }

straight-flow turbine [MECH ENG] A horizontal-axis, low-head hydraulic turbine in which the upstream and downstream reservoirs are connected by a straight tube into which the runners are integrated, with the generator placed directly on the periphery of these runners. { 'strāt ¦flō 'tər·bən }

straight joint [BUILD] **1.** A continuous joint formed by the ends of parallel floor boards or masonry units and oriented perpendicularly to their length. **2.** A joint between two pieces of wood that are set edge to edge without tongues and grooves, dowels, or overlap to bind them. Also known as square joint. { 'strāt 'jȯint }

straight-line mechanism [MECH ENG] A linkage so proportioned and constrained that some point on it describes over part of its motion a straight or nearly straight line. { 'strāt ¦līn 'mek·əˌniz·əm }

straight-line motion [CONT SYS] A method of moving a robot between via or way points in which the end effector moves only along segments of straight lines, stopping momentarily for any change in direction. { 'strāt ¦līn 'mō·shən }

straight piecework system *See* one-hundred-percent premium plan. { 'strāt 'pēsˌwərk ˌsis·təm }

straight proportional system *See* one-hundred-percent premium plan. { 'strāt prəˈpȯr·shən·əl ˌsis·təm }

straight-run [CHEM ENG] Petroleum fractions derived from the straight distillation of crude oil without chemical reaction or molecular modification. Also known as virgin. { 'strāt 'rən }

straight-run distillation [CHEM ENG] Continuous nonreactive distillation of petroleum oil to separate it into products in the order of their boiling points. { 'strāt ¦rən ˌdis·təˈlā·shən }

straight strap clamp [DES ENG] A clamp made of flat stock with an elongated slot for convenient positioning; held in place by a T bolt and nut. { 'strāt ¦strap 'klamp }

straight-tube boiler [MECH ENG] A water-tube boiler in which all the tubes are devoid of curvature and therefore require suitable connecting devices to complete the circulatory system. Also known as header-type boiler. { 'strāt ¦tüb 'bȯi·lər }

straight turning [MECH ENG] Work turned in a lathe so that the diameter is constant over the length of the workpiece. { 'strāt 'tərn·iŋ }

straightway pump [MECH ENG] A pump with suction and discharge valves arranged to give a direct flow of fluid. { 'strātˌwā ˌpəmp }

straight wheel [DES ENG] A grinding wheel whose sides or face are straight and not in any way changed from a cylindricalform. { 'strāt ¦wēl }

strain [MECH] Change in length of an object in some direction per unit undistorted length in some direction, not necessarily the same; the nine possible strains form a second-rank tensor. { strān }

strain axis *See* principal axis of strain. { 'strān ˌak·səs }

strain ellipsoid [MECH] A mathematical representation of the strain of a homogeneous body by a strain that is the same at all points or of unequal stress at a particular point. Also known as deformation ellipsoid. { 'strān iˈlipˌsȯid }

strain energy [MECH] The potential energy stored in a body by virtue of an elastic deformation, equal to the work that must be done to produce this deformation. { 'strān ˌen·ər·jē }

strainer [ENG] A porous or screen medium used ahead of equipment to filter out harmful solid objects and particles from a fluid stream; used for example, in river-water intakes for process plants or to remove decomposition products from the circulating fluid in a hydraulic system. { 'strān·ər }

strain foil [ENG] A strain gage produced from thin foil by photoetching techniques; may be applied to curved surfaces, has low transverse sensitivity, exhibits negligible hysteresis under cycling loads, and creeps little under sustained loads. { 'strān ˌfȯil }

strain gage [ENG] A device which uses the change of electrical resistance of a wire under strain to measure pressure. { 'strān ˌgāj }

strain-gage accelerometer [ENG] Any accelerometer whose operation depends on the fact that the resistance in a wire changes when it is strained; these devices are classified as bonded or unbonded. { 'strān ¦gāj akˌsel·əˈräm·əd·ər }

strain-gage bridge [ENG] A bridge arrangement of four strain gages, cemented to a stressed part in such a way that two gages show increases in resistance and two show decreases when the part is stressed; the change in output voltage under stress is thus much higher than that for a single gage. { 'strān ¦gāj ˌbrij }

straining beam [CIV ENG] A short piece of timber in a truss that holds the ends of struts or rafters. Also known as straining piece. { 'strān·iŋ ˌbēm }

straining piece *See* straining beam. { 'strān·iŋ ˌpēs }

strain rate [MECH] The time rate for the usual tensile test. { 'strān ˌrāt }

strain rosette [MECH] A pattern of intersecting lines on a surface along which linear strains are

measured to find stresses at a point. { 'strān rō,zet }

strain seismograph [ENG] A seismograph that detects secular strains related to tectonic processes and tidal yielding of the solid earth; also detects strains associated with propagating seismic waves. { 'strān 'sīz·mə,graf }

strain seismometer [ENG] A seismometer that measures relative displacement of two points in order to detect deformation of the ground. { 'strān sīz'mäm·əd·ər }

strain tensor [MECH] A second-rank tensor whose components are the nine possible strains. { 'strān ,ten·sər }

strake [BUILD] A course of clapboarding on a house. [CIV ENG] A row of steel plates installed on a tall steel chimney. { strāk }

strand [ENG] **1.** One of a number of steel wires twisted together to form a wire rope or cable or an electrical conductor. **2.** A thread, yarn, string, rope, wire, or cable of specified length. **3.** One of the fibers or filaments twisted or laid together into yarn, thread, rope, or cordage. { strand }

strand burner [ENG] A device that determines the rate at which a propellant burns at various pressures by using a propellant strand. { 'strand ,bər·nər }

stranded caisson *See* box caisson. { 'stran·dəd 'kā,sän }

stranding machine *See* closing machine. { 'strand·iŋ mə,shēn }

strap bolt [DES ENG] **1.** A bolt with a hook or flat extension instead of a head. **2.** A bolt with a flat center portion and which can be bent into a U shape. { 'strap ,bōlt }

strap hammer [MECH ENG] A heavy hammer controlled and operated by a belt drive in which the head is slung from a strap, usually of leather. { 'strap ,ham·ər }

strap hinge [DES ENG] A hinge fastened to a door and the adjacent wall by a long hinge. { 'strap ,hinj }

strapped wall *See* battened wall. { 'strapt ¦wȯl }

strategic material [IND ENG] A material needed for the industrial support of a war effort. { strə'tē·jik mə'tir·ē·əl }

stratified charge engine [MECH ENG] An internal combustion engine that uses a fuel charge consisting of two layers; a rich mixture is close to the spark plug, and combustion promotes ignition of a lean mixture in the remainder of the cylinder. { 'strad·ə,fīd 'chärj ,en·jən }

stray capacitance [ELECTR] Undesirable capacitance between circuit wires, between wires and the chassis, or between components and the chassis of electronic equipment. { 'strā kə'pas·əd·əns }

stray current [ELEC] **1.** A portion of a current that flows over a path other than the intended path, and may cause electrochemical corrosion of metals in contact with electrolytes. **2.** An undesirable current generated by discharge of static electricity; it commonly arises in loading and unloading petroleum fuels and some chemicals, and can initiate explosions. { 'strā ,kə·rənt }

stray line [ENG] An ungraduated portion of the line connected to a current pole, used so that the pole will acquire the speed of the current before a measurement is begun. { 'strā ¦līn }

stream day [CHEM ENG] Denoting a 24-hour actual operation of a processing unit, in contrast to the hours actually operated during a calendar (24-hour) day. { 'strēm 'dā }

stream gage *See* river gage. { 'strēm ,gāj }

streamlining [DES ENG] The contouring of a body to reduce its resistance to motion through a fluid. { 'strēm,līn·iŋ }

street [CIV ENG] A paved road for vehicular traffic in an urban area. { strēt }

street elbow [DES ENG] A pipe elbow with an internal thread at one end and an external thread at the other. { 'strēt ,el·bō }

stremmatograph [ENG] An instrument for measuring longitudinal stress in rails as trains pass over. { strə'mad·ə,graf }

strength [MECH] The stress at which material ruptures or fails. { streŋkth }

stress [MECH] The force acting across a unit area in a solid material resisting the separation, compacting, or sliding that tends to be induced by external forces. { stres }

stress amplitude [MECH ENG] One half the algebraic difference between the maximum and minimum stress in one fatigue test cycle. { 'stres ,am·plə,tüd }

stress axis *See* principal axis of stress. { 'stres ,ak·səs }

stress concentration [MECH] A condition in which a stress distribution has high localized stresses; usually induced by an abrupt change in the shape of a member; in the vicinity of notches, holes, changes in diameter of a shaft, and so forth, maximum stress is several times greater than where there is no geometrical discontinuity. { 'stres ,kän·sən,trā·shən }

stress concentration factor [MECH] A theoretical factor K_t expressing the ratio of the greatest stress in the region of stress concentration to the corresponding nominal stress. { 'stres ,kän·sən¦trā·shən ,fak·tər }

stress crack [MECH] An external or internal crack in a solid body (metal or plastic) caused by tensile, compressive, or shear forces. { 'stres ,krak }

stress difference [MECH] The difference between the greatest and the least of the three principal stresses. { 'stres ,dif·rəns }

stressed skin construction [CIV ENG] A type of construction in which the outer skin and the framework interact, thus contributing to the flexural strength of the unit. { 'strest ¦skin kən 'strək·shən }

stress ellipsoid [MECH] A mathematical representation of the state of stress at a point that is defined by the minimum, intermediate, and maximum stresses and their intensities. { 'stres i'lip,sȯid }

stress equivalent [IND ENG] A quantitative expression that can be used to compare the physiological outputs generated by different types of work stress. { 'stres i,kwiv·ə·lənt }

stress function [MECH] A single function, such as the Airy stress function, or one of two or more functions, such as Maxwell's or Morera's stress functions, that uniquely define the stresses in an elastic body as a function of position. { 'stres ˌfəŋk·shən }

stress intensity [MECH] Stress at a point in a structure due to pressure resulting from combined tension (positive) stresses and compression (negative) stresses. { 'stres in,ten·səd·ē }

stress lines *See* isostatics. { 'stres ˌlīnz }

stress range [MECH] The algebraic difference between the maximum and minimum stress in one fatigue test cycle. { 'stres ˌrānj }

stress ratio [MECH] The ratio of minimum to maximum stress in fatigue testing, considering tensile stresses as positive and compressive stresses as negative. { 'stres ˌrā·shō }

stress sensor [CONT SYS] A contact sensor that responds to the forces produced by mechanical contact. { 'stres ˌsen·sər }

stress-strain curve *See* deformation curve. { 'stres 'strān ˌkərv }

stress tensor [MECH] A second-rank tensor whose components are stresses exerted across surfaces perpendicular to the coordinate directions. { 'stres ˌten·sər }

stress test [ENG] A test of equipment under extreme conditions, outside the range anticipated in normal operation. { 'stres ˌtest }

stress trajectories *See* isostatics. { 'stres trəˌjek·trēz }

stress transmittal [IND ENG] Transfer of external force from a human-equipment interface to various points of the body. { 'stres tranzˌmid·əl }

stretcher [CIV ENG] A brick or block that is laid with its length paralleling the wall. { 'strech·ər }

stretcher bond [CIV ENG] A bond that consists entirely of stretchers, with each vertical joint lying between the centers of the stretchers above and below. { 'strech·ər ˌbänd }

stretch former [MECH ENG] A machine used to form materials, such as metals and plastics, by stretching over a mold. { 'strech ˌfȯr·mər }

stretch forming [MECH ENG] Shaping metals and plastics by applying tension to stretch the heated sheet or part, wrapping it around a die, and then cooling it. Also known as wrap forming. { 'strech ˌfȯrm·iŋ }

stretch out [IND ENG] A reduction in the delivery rate specified for a program without a reduction in the total quantity to be delivered. { 'strech ¦aůt }

strich *See* millimeter. { strich }

striding compass [ENG] A compass mounted on a theodolite for orientation. { 'strīd·iŋ ˌkäm·pəs }

strike-off board [ENG] A straight-edge board used to remove excess, freshly placed plaster, concrete, or mortar from a surface. { 'strīk ˌȯf ˌbȯrd }

strike plate [DES ENG] A metal plate or box which is set in a door jamb and is either pierced or recessed to receive the bolt or latch of a lock. { 'strīk ˌplāt }

striking hammer [ENG] A hammer used to strike a rock drill. { 'strīk·iŋ ˌham·ər }

striking velocity *See* impact velocity. { 'strīk·iŋ vəˌläs·əd·ē }

string [ENG] A piece of pipe, casing, or other down-hole drilling equipment coupled together and lowered into a borehole. [MECH] A solid body whose length is many times as large as any of its cross-sectional dimensions, and which has no stiffness. { striŋ }

stringcourse [BUILD] A horizontal band of masonry, generally narrower than other courses and sometimes projecting, extending across the facade of a structure and in some instances encircling pillars or engaged columns. Also known as belt course. { 'striŋˌkȯrs }

string electrometer [ENG] An electrometer in which a conducting fiber is stretched midway between two oppositely charged metal plates; the electrostatic field between the plates displaces the fiber laterally in proportion to the voltage between the plates. { 'striŋ ˌi,lek'träm·əd·ər }

stringer [CIV ENG] **1.** A long horizontal member used to support a floor or to connect uprights in a frame. **2.** An inclined member supporting the treads and risers of a staircase. { 'striŋ·ər }

string galvanometer [ENG] A galvanometer consisting of a silver-plated quartz fiber under tension in a magnetic field, used to measure oscillating currents. Also known as Einthoven galvanometer. { 'striŋ ˌgal·və'näm·əd·ər }

string milling [MECH ENG] A milling method in which parts are placed in a row and milled consecutively. { 'striŋ ˌmil·iŋ }

strip [ENG] **1.** To remove insulation from a wire. **2.** To break or otherwise damage the threads of a nut or bolt. { strip }

strip-borer drill [MECH ENG] An electric or diesel skid- or caterpillar-mounted drill used at quarry or opencast sites to drill 3- to 6-inch-diameter (8- to 15-centimeter), horizontal blast holes up to 100 feet (30 meters) in length, without the use of flush water. { 'strip ˌbȯr·ər ˌdril }

strip-chart recorder [ENG] A recorder in which one or more writing pens or other recording devices trace changes in a measured variable on the surface of a strip chart that is moved at constant speed by a time-clock motor. { 'strip ˌchärt ri ˌkȯrd·ər }

stripper [CHEM ENG] An evaporative device for the removal of vapors from liquids; can be in a bubble-tray distillation tower, a vacuum vessel, or an evaporator; if it is a part of a distillation column below the feed tray, it is called the stripping section. [ENG] A hand or motorized tool used to remove insulation from wires. { 'strip·ər }

stripper plate [ENG] In plastics molding, a plate

that strips a molded article free of core pins or force plugs. { 'strip·ər ˌplāt }

stripping [CHEM ENG] In petroleum refining, the removal (by flash evaporation or steam-induced vaporation) of the more volatile components from a cut or fraction; used to raise the flash point of kerosine, gas oil, or lubricating oil. { 'strip·iŋ }

strip printer [ENG] A device that prints computer, telegraph, or industrial output information along a narrow paper tape which resembles a ticker tape. { 'strip ˌprint·ər }

stroboscope [ENG] An instrument for making moving bodies visible intermittently, either by illuminating the object with brilliant flashes of light or by imposing an intermittent shutter between the viewer and the object; a high-speed vibration can be made visible by adjusting the strobe frequency close to the vibration frequency. { 'strō·bəˌskōp }

stroboscopic disk [ENG] A printed disk having a number of concentric rings each containing a different number of dark and light segments; when the disk is placed on a phonograph turntable or rotating shaft and illuminated at a known frequency by a flashing discharge tube, speed can be determined by noting which pattern appears to stand still or to rotate slowly. { ˌsträb·əˌskäp·ik 'disk }

stroboscopic tachometer [ENG] A stroboscope having a scale that reads in flashes per minute or in revolutions per minute; the speed of a rotating device is measured by directing the stroboscopic lamp on the device, adjusting the flashing rate until the device appears to be stationary, then reading the speed directly on the scale of the instrument. { ˌsträb·əˌskäp·ik tə'käm·əd·ər }

stroke [ELECTR] The penlike motion of a focused electron beam in cathode-ray-tube diplays. [MECH ENG] The linear movement, in either direction, of a reciprocating mechanical part. Also known as throw. { strōk }

stroke-bore ratio [MECH ENG] The ratio of the distance traveled by a piston in a cylinder to the diameter of the cylinder. { 'strōk 'bȯr ˌrā·shō }

strongly typed language [CONT SYS] A high-level programming language in which the type of each variable must be declared at the beginning of the program, and the language itself then enforces rules concerning the manipulation of variables according to their types. { 'strȯŋ·lē ˌtīpt 'laŋ·gwij }

Strouhal number [MECH] A dimensionless number used in studying the vibrations of a body past which a fluid is flowing; it is equal to a characteristic dimension of the body times the frequency of vibrations divided by the fluid velocity relative to the body; for a taut wire perpendicular to the fluid flow, with the characteristic dimension taken as the diameter of the wire, it has a value between 0.185 and 0.2 Symbolized S_r. Also known as reduced frequency. { 'strü·əl ˌnəm·bər }

struck joint [CIV ENG] A mortar joint in brickwork formed by pressing the trowel in at the lower edge, so that a recess is formed at the bottom of the joint; suitable only for interior work. { 'strək ˌjȯint }

structural analysis [ENG] The determination of stresses and strains in a given structure. { 'strək·chə·rəl ə'nal·ə·səs }

structural connection [CIV ENG] A means of joining the individual members of a structure to form a complete assembly. { 'strək·chə·rəl kə'nek·shən }

structural deflections [MECH] The deformations or movements of a structure and its flexural members from their original positions. { 'strək·chə·rəl di'flek·shənz }

structural drill [MECH ENG] A highly mobile diamond- or rotary-drill rig complete with hydraulically controlled derrick mounted on a truck, designed primarily for rapidly drilling holes to determine the structure in subsurface strata or for use as a shallow, slim-hole producer or seismograph drill. { 'strək·chə·rəl 'dril }

structural drilling [ENG] Drilling done specifically to obtain detailed information delineating the location of folds, domes, faults, and other subsurface structural features indiscernible by studying strata exposed at the surface. { 'strək·chə·rəl 'dril·iŋ }

structural engineering [CIV ENG] A branch of civil engineering dealing with the design of structures such as buildings, dams, and bridges. { 'strək·chə·rəl ˌen·jə'nir·iŋ }

structural frame [BUILD] The entire set of members of a building or structure required to transmit loads to the ground. { 'strək·chə·rəl 'frām }

structural riveting [ENG] Riveting structural members by using punched holes. { 'strək·chə·rəl 'riv·əd·iŋ }

structural wall *See* bearing wall. { 'strək·chə·rəl 'wȯl }

structure [CIV ENG] Something, as a bridge or a building, that is built or constructed and designed to sustain a load. { 'strək·chər }

structured analysis [SYS ENG] A method of breaking a large problem or process into smaller components to aid in understanding, and then identifying the components and their interrelationships and reassembling them. { 'strək·chərd ə'nal·ə·səs }

structure number [DES ENG] A number, generally from 0 to 15, indicating the spacing of abrasive grains in a grinding wheel relative to their grit size. { 'strək·chər ˌnəm·bər }

strut [CIV ENG] A long structural member of timber or metal, or a bar designed to resist pressure in the direction of its length. [ENG] **1.** A brace or supporting piece. **2.** A diagonal brace between two legs of a drill tripod or derrick. { strət }

Stuart windmill *See* Fales-Stuart windmill. { 'stü·ərt 'winˌmil }

stub [CIV ENG] A projection on a sewer pipe that provides an opening to accept a connection to another pipe or house sewer. { stəb }

stub axle [MECH ENG] An axle carrying only one wheel. { 'stəb ˌak·səl }

stub mortise [ENG] A mortise which passes through only part of a timber. { 'stəb ˌmȯrd·əs }

Stubs gage [DES ENG] A number system for denoting the thickness of steel wire and drills. { 'stəbz ˌgāj }

stub switch [ENG] A pair of short switch rails, held only at or near one end and free to move at the other end; used in mining and to some extent on narrow-gage industrial tramways. { 'stəb ˌswich }

stub tenon [ENG] A tenon that fits into a stub mortise. { 'stəb ˈten·ən }

stub tube [MECH ENG] A short tube welded to a boiler or pressure vessel to provide for the attachment of additional parts. { 'stəb ˌtüb }

stud [BUILD] One of the vertical members in the walls of a framed building to which wallboards, lathing, or paneling is nailed or fastened. [DES ENG] **1.** A rivet, boss, or nail with a large, ornamental head. **2.** A short rod or bolt threaded at both ends without a head. { stəd }

stud driver [MECH ENG] A device, such as an impact wrench, for driving a hardened steel nail (stud) into concrete or other hard materials. { 'stəd ˌdrī·vər }

stud wall [BUILD] A wall formed with timbers; studs are usually spaced 12–16 inches (30–41 centimeters) on center. { 'stəb ˌwȯl }

stuffing [ENG] A method of sealing the mechanical joint between two metal surfaces; packing (stuffing) material is inserted within the seal area container (the stuffing or packing box), and compressed to a liquid-proof seal by a threaded packing ring follower. Also known as packing. { 'stəf·iŋ }

stuffing box [ENG] A packed, pressure-tight joint for a rod that moves through a hole, to reduce or eliminate fluid leakage. { 'stəf·iŋ ˌbäks }

stuffing nut [ENG] A nut for adjusting a stuffing box. { 'stəf·iŋ ˌnət }

style *See* gnomon. { stīl }

stylus [ENG ACOUS] The portion of a phonograph pickup that follows the modulations of a record groove and transmits the resulting mechanical motions to the transducer element of the pickup for conversion to corresponding audio-frequency signals. Also known as needle; phonograph needle; reproducing stylus. { 'stī·ləs }

subaperture [ENG] Any subset of an array of transmitters of acoustic or electromagnetic radiation. { səb'ap·ə·chər }

subassembly [ELECTR] Two or more components combined into a unit for convenience in assembling or servicing equipment; an intermediate-frequency strip for a receiver is an example. [ENG] A structural unit, which, though manufactured separately, was designed for incorporation with other parts in the final assembly of a finished product. { ˌsəb·ə'sem·blē }

subatmospheric heating system [MECH ENG] A system which regulates steam flow into the main throttle valve under automatic thermostatic control and maintains a fixed vacuum differential between supply and return by means of a differential controller and a vacuum pump. { ˌsəb,at·mə'sfir·ik 'hēd·iŋ ˌsis·təm }

subbottom depth recorder [ENG] A compact seismic instrument which can provide continuous soundings of strata beneath the ocean bottom utilizing the low-frequency output of an intense electrical spark discharge source in water. { ˌsəb'bäd·əm 'depth riˌkȯrd·ər }

subcarrier oscillator [ELECTR] **1.** The crystal oscillator that operates at the chrominance subcarrier or burst frequency of 3.579545 megahertz in a color television receiver; this oscillator, synchronized in frequency and phase with the transmitter master oscillator, furnishes the continuous subcarrier frequency required for demodulators in the receiver. **2.** An oscillator used in a telemetering system to translate variations in an electrical quantity into variations of a frequency-modulated signal at a subcarrier frequency. { ˌsəb'kar·ē·ər 'äs·əˌlād·ər }

subcomponent [DES ENG] A part of a component having characteristics of the component. { 'səb·kəmˌpō·nənt }

subcontract [ENG] A contract made with a third party by one who has contracted to perform work or service for whole or part performance of that work or service. { ˌsəb'känˌtrakt }

subcontractor [ENG] A manufacturer or organization that receives a contract from a prime contractor for a portion of the work on a project. { ˌsəb'känˌtrak·tər }

subdrainage [CIV ENG] Natural or artificial removal of water from beneath a lined conduit. { ˌsəb'drā·nij }

subdrilling [ENG] Refers to the breaking of the base in which boreholes are drilled 1 foot (0.3 meter) or several feet below the level of the quarry floor. { ˌsəb'dril·iŋ }

subfloor [BUILD] The rough floor which rests on the floor joists and on which the finished floor is laid. Also known as blind floor; counterfloor. { 'səbˌflȯr }

subgrade [CIV ENG] The soil or rock leveled off to support the foundation of a structure. { 'səbˌgrād }

sublimation [THERMO] The process by which solids are transformed directly to the vapor state or vice versa without passing through the liquid phase. { ˌsəb·lə'mā·shən }

sublimation cooling [THERMO] Cooling caused by the extraction of energy to produce sublimation. { ˌsəb·lə'mā·shən ˈkül·iŋ }

sublimation curve [THERMO] A graph of the vapor pressure of a solid as a function of temperature. { ˌsəb·lə'mā·shən ˈkərv }

sublimation energy [THERMO] The increase in internal energy when a unit mass, or 1 mole, of a solid is converted into a gas, at constant pressure and temperature. { ˌsəb·lə'mā·shən ˈen·ər·jē }

sublimation point [THERMO] The temperature at which the vapor pressure of the solid phase

of a compound is equal to the total pressure of the gas phase in contact with it; analogous to the boiling point of a liquid. {ˌsəb·lə'mā·shən ˈpȯint}

sublimation pressure [THERMO] The vapor pressure of a solid. {ˌsəb·lə'mā·shən ˈpresh·ər}

sublime [THERMO] To change from the solid to the gaseous state without passing through the liquid phase. {sə'blīm}

submarine blast [ENG] A charge of high explosives fired in boreholes drilled in the rock underwater for dislodging dangerous projections and for deepening channels. {ˈsəb·məˌrēn 'blast}

submarine gate [ENG] An edge gate with the opening from the runner into the mold positioned below the printing line or mold surface. {ˈsəb·məˌrēn 'gāt}

submarine oscillator [ENG ACOUS] A large, electrically operated diaphragm horn which produces a powerful sound for signaling through water. {ˈsəb·məˌrēn 'äs·əˌlād·ər}

submarine pipeline [ENG] A pipeline installed under water, resting on the bed of the waterway; frequently used for petroleum or natural gas transport across rivers, lakes, or bays. {ˈsəb·məˌrēn 'pīpˌlīn}

submarine sentry [ENG] A form of underwater kite towed at a predetermined constant depth in search of elevations of the bottom; the kite rises to the surface upon encountering an obstruction. {ˈsəb·məˌrēn 'sen·trē}

submarine wave recorder [ENG] An instrument for measuring the changing water height above a hovering submarine by measuring the time required for sound emitted by an inverted echo sounder on the submarine to travel to the surface and return. {ˈsəb·məˌrēn 'wāv riˌkȯrd·ər}

submerged-combustion evaporator [ENG] A liquid-evaporation device in which heat is provided by combustion gases bubbling up through the liquid; the burner is submerged in the body of the liquid. {səb'mərjd kəmˈbəs·chən i'vap·əˌrād·ər}

submerged-combustion heater [ENG] A combustion device in which fuel and combustion air are mixed and ignited below the surface of a liquid; used in heaters and evaporators where absorption of the combustion products will not be detrimental. {səb'mərjd kəmˈbəs·chən 'hēd·ər}

submerged weir [CIV ENG] A dam which, when in use, has the downstream water level at an elevation equal to or higher than the crest of the dam. {səb'mərjd 'wer}

submersible pump [MECH ENG] A pump and its electric motor together in a protective housing which permits the unit to operate under water. {səb'mər·sə·bəl 'pəmp}

suboptimization [SYS ENG] The process of fulfilling or optimizing some chosen objective which is an integral part of a broader objective; usually the broad objective and lower-level objective are different. {ˈsəbˌäp·tə·məˈzā·shən}

subsidiary conduit [CIV ENG] Terminating branch of an underground conduit run extending from a manhole or handhole to a nearby building, handhole, or pole. {səb'sid·ēˌer·ē 'kän·dü·ət}

subsonic inlet [ENG] An entrance or orifice for the admission of fluid flowing at speeds less than the speed of sound in the fluid. {ˈsəb'sän·ik 'inˌlet}

subsonic nozzle [ENG] A nozzle through which a fluid flows at speed less than the speed of sound in the fluid. {ˈsəb'sän·ik 'näz·əl}

substation [ELEC] *See* electric power substation. [ENG] An intermediate compression station to repressure a fluid being transported by pipeline over a long distance. {'səbˌstā·shən}

substitution weighing [MECH] A method of weighing to allow for differences in lengths of the balance arms, in which the object to be weighed is first balanced against a counterpoise, and the known weights needed to balance the same counterpoise are then determined. Also known as counterpoise method. {ˌsəb·stə'tü·shən ˌwā·iŋ}

substrate [ELECTR] The physical material on which a microcircuit is fabricated; used primarily for mechanical support and insulating purposes, as with ceramic, plastic, and glass substrates; however, semiconductor and ferrite substrates may also provide useful electrical functions. [ENG] Basic surface on which a material adheres, for example, paint or laminate. {'səbˌstrāt}

substructure [CIV ENG] The part of a structure which is below ground. {ˈsəb'strək·chər}

subsurface radar *See* ground-probing radar. {ˌsəbˌsər·fəs 'rā·dar}

subsurface waste disposal [ENG] A waste disposal method for manufacturing wastes in porous underground rock formations. {ˈsəb'sər·fəs 'wāst diˌspōz·əl}

subsynchronous [ELEC] Operating at a frequency or speed that is related to a submultiple of the source frequency. {ˈsəb'siŋ·krə·nəs}

subsystem [ENG] A major part of a system which itself has the characteristics of a system, usually consisting of several components. {'səbˌsis·təm}

subtense bar [ENG] The horizontal bar of fixed length in the subtense technique of distance measurement method. {ˈsəb'tens 'bär}

subtense technique [CIV ENG] A distance measuring technique in which the transit angle subtended by the subtense bar enables the computation of the transit-to-bar distance. {ˈsəb 'tens tek'nēk}

subtracted time [IND ENG] In a continuous timing technique, the difference between two successive readings of a stopwatch. {səbˈtrak·təd 'tīm}

subtractive synthesis [ENG ACOUS] A method of synthesizing musical tones, in which an electronic circuit produces a standard waveform (such as a sawtooth wave), which contains a very large number of harmonics at known relative

amplitudes, and this circuit is followed by a variety of electric or electronic filters to convert the basic tone signals into the desired musical waveforms. { səb,trak·tiv 'sin·thə·səs }

subtractor [ELECTR] A circuit whose output is determined by the differences in analog or digital input signals. { səb'trak·tər }

subway [CIV ENG] An underground passage. { 'səb,wā }

subwoofer [ENG ACOUS] A loudspeaker designed to reproduce extremely low audio frequencies, extending into the infrasonic range, generally used in conjunction with a crossover network, a woofer, and a tweeter. { 'səb,wúf·ər }

Sucksmith ring balance [ENG] A magnetic balance in which the specimen is rigidly suspended from a phosphor bronze ring carrying two mirrors that convert small deflections of the specimen in a nonuniform magnetic field into large deflections of a light beam; used chiefly to measure paramagnetic susceptibility. { ¦sək,smith 'riŋ ,bal·ənS }

suction anemometer [ENG] An anemometer consisting of an inverted tube which is half-filled with water that measures the change in water level caused by the wind's force. { 'sək·shən ,an·ə'mäm·əd·ər }

suction cup [ENG] A cup, often of flexible material such as rubber, in which a partial vacuum is created when it is inverted on a surface; the vacuum tends to hold the cup in place. { 'sək·shən ,kəp }

suction-cutter dredger [MECH ENG] A dredger in which rotary blades dislodge the material to be excavated, which is then removed by suction as in a sand-pump dredger. { 'sək·shən ¦kəd·ər ,drej·ər }

suction head *See* suction lift. { 'sək·shən ,hed }

suction lift [MECH ENG] The head, in feet, that a pump must provide on the inlet side to raise the liquid from the supply well to the level of the pump. Also known as suction head. { 'sək·shən ,lift }

suction line [ENG] A pipe or tubing feeding into the inlet of a fluid impelling device (for example, pump, compressor, or blower), consequently under suction. { 'sək·shən ,līn }

suction pump [MECH ENG] A pump that raises water by the force of atmospheric pressure pushing it into a partial vacuum under the valved piston, which retreats on the upstroke. { 'sək·shən ,pəmp }

suction stroke [MECH ENG] The piston stroke that draws a fresh charge into the cylinder of a pump, compressor, or internal combustion engine. { 'sək·shən ,strōk }

Suhl effect [ELECTR] When a strong transverse magnetic field is applied to an *n*-type semiconducting filament, holes injected into the filament are deflected to the surface, where they may recombine rapidly with electrons or be withdrawn by a probe. { 'sül i,fekt }

sulfate pulping [CHEM ENG] A wood-pulping process in which sodium sulfate is used in the caustic soda pulp-digestion liquor. Also known as kraft process; kraft pulping. { 'səl,fāt 'pəlp·iŋ }

sulfur hexameter [ENG] An instrument used to measure or to continuously monitor the amount of sulfur hexafluoride present in a waveguide or other device in which this gas is used as a dielectric. { 'səl·fər hek'sam·əd·ər }

sulfuric acid alkylation [CHEM ENG] A petroleum refinery alkylation process in which three-carbon, four-carbon, and five-carbon olefins combine with isobutane in the presence of a sulfuric acid catalyst to form high-octane, branched-chain hydrocarbons; used in motor gasoline. { ¦səl¦fyür·ik 'as·əd ,al·kə'lā·shən }

sullage [CIV ENG] Drainage or wastewater from a building, farmyard, or street. { 'səl·ij }

Sullivan angle compressor [MECH ENG] A two-stage compressor in which the low-pressure cylinder is horizontal and the high-pressure cylinder is vertical; a compact compressor driven by a belt, or directly connected to an electric motor or diesel engine. { 'səl·ə·vən 'aŋ·gəl kəm ,pres·ər }

Sulzer two-cycle engine [MECH ENG] An internal combustion engine utilizing the Sulzer Company system for the effective scavenging and charging of the two-cycle diesel engine. { 'səlt·sər 'tü ,sī·kəl 'en·jən }

summing amplifier [ELECTR] An amplifier that delivers an output voltage which is proportional to the sum of two or more input voltages or currents. { 'səm·iŋ 'am·plə,fī·ər }

sump [ENG] A pit or tank which receives and temporarily stores drainage at the lowest point of a circulating or drainage system. Also known as sump pit. { səmp }

sump fuse [ENG] A fuse used for underwater blasting. { 'səmp ,fyüz }

sump pit *See* sump. { 'səmp ,pit }

sump pump [MECH ENG] A small, single-stage vertical pump used to drain shallow pits or sumps. { 'səmp ,pəmp }

sun-and-planet motion [MECH ENG] A train of two wheels moving epicyclically with a small wheel rotating a wheel on the central axis. { ¦sən ən ¦plan·ət 'mō·shən }

sun gear *See* central gear. { 'sən ,gir }

sunk draft [BUILD] A recessed margin around a building stone that imparts a raised appearance to the stone. { 'səŋk ¦draft }

sunk face [BUILD] A building stone from whose face some material has been removed in order to impart the appearance of a sunk panel. { 'səŋk ¦fās }

sunk panel [BUILD] A panel that is recessed below the face of its framing or other surrounding surface. { 'səŋk ¦pan·əl }

sunshine integrator [ENG] An instrument for determining the duration of sunshine (daylight) in any locality. { 'sən,shīn ,int·ə,grād·ər }

sunshine recorder [ENG] An instrument designed to record the duration of sunshine without regard to intensity at a given location; sunshine recorders may be classified in two groups according to the method by which the time scale

is obtained: in one group the time scale is obtained from the motion of the sun in the manner of a sun dial, in the second group the time scale is supplied by a chronograph. { 'sən,shīn ri ,kȯrd·ər }

superabrasive [MECH ENG] A material having characteristically long life and high grinding productivity such as cubic boron nitride or polycrystalline diamond. { 'sü·pər·ə,brā·siv }

supercalendering [ENG] A calendering process that uses both steam and high pressure to give calendered material, for example, paper, a high-density finish. { ¦sü·pər'kal·ən·driŋ }

supercardioid microphone [ENG ACOUS] A microphone whose response pattern resembles a cardioid but is exaggerated along the axis of maximum response, so that it is highly sensitive in one direction and insensitive in all others. Also known as superdirectional microphone. { ¦sü·pər,kärd·ē,ȯid 'mī·krə,fōn }

supercentrifuge [MECH ENG] A centrifuge built to operate at faster speeds than an ordinary centrifuge. { ¦sü·pər'sen·trə,fyüj }

supercharge method [ENG] A method for measuring the knock-limited power, under supercharge rich-mixture conditions, of fuels for use in spark-ignition aircraft engines. { ¦sü·pər ,chärj ,meth·əd }

supercharger [MECH ENG] An air pump or blower in the intake system of an internal combustion engine used to increase the weight of air charge and consequent power output from a given engine size. { 'sü·pər,chär·jər }

supercharging [MECH ENG] A method of introducing air for combustion into the cylinder of an internal combustion engine at a pressure in excess of that which can be obtained by natural aspiration. { 'sü·pər,chärj·iŋ }

supercobalt drill [DES ENG] A drill made of 8% cobalt highspeed steel; used for drilling work-hardened stainless steels, silicon chrome, and certain chrome-nickel alloy steels. { ¦sü·pər'kō ,bȯlt ,dril }

supercompressibility factor *See* compressibility factor. { ¦sü·pər·kəm,pres·ə'bil·əd·ē ,fak·tər }

superconducting gyroscope *See* cryogenic gyroscope. { ¦sü·pər·kən'dəkt·iŋ 'jī·rə,skōp }

superconducting quantum interference device [ELECTR] A superconducting ring that couples with one or two Josephson junctions; applications include high-sensitivity magnetometers, near-magnetic-field antennas, and measurement of very small currents or voltages. Abbreviated SQUID. { ¦sü·pər·kən'dəkt·iŋ 'kwän·təm ,in·tər ¦fir·ənz di,vīs }

supercooling [THERMO] Cooling of a substance below the temperature at which a change of state would ordinarily take place without such a change of state occurring, for example, the cooling of a liquid below its freezing point without freezing taking place; this results in a metastable state. { ¦sü·pər'kül·iŋ }

supercritical [THERMO] Property of a gas which is above its critical pressure and temperature. { ¦sü·pər'krid·ə·kəl }

supercritical fluid [THERMO] A fluid at a temperature and pressure above its critical point; also, a fluid above its critical temperature regardless of pressure. { ¦sü·pər¦krid·ə·kəl 'flü·əd }

supercritical-fluid extraction [CHEM ENG] A separation process that uses a supercritical fluid as the solvent. { ¦sü·pər¦krid·ə·kəl 'flü·əd ik 'strak·shən }

superdirectional microphone *See* supercardioid microphone. { ,sü·pər·di,rek·shən·əl 'mī·krə ,fōn }

superficial expansivity *See* coefficient of superficial expansion. { ¦sü·pər¦fish·əl ,ik,span'siv·əd·ē }

superheat [THERMO] Sensible heat in a gas above the amount needed to maintain the gas phase. { 'sü·pər,hēt }

superheated vapor [THERMO] A vapor that has been heated above its boiling point. { ¦sü·pər'hēd·əd 'vā·pər }

superheater [MECH ENG] A component of a steam-generating unit in which steam, after it has left the boiler drum, is heated above its saturation temperature. { ¦sü·pər'hēd·ər }

superheating [THERMO] Heating of a substance above the temperature at which a change of state would ordinarily take place without such a change of state occurring, for example, the heating of a liquid above its boiling point without boiling taking place; this results in a metastable state. { ¦sü·pər'hēd·iŋ }

superhighway [CIV ENG] A broad highway, such as an expressway, freeway, turnpike, for high-speed traffic. { ¦sü·pər'hī,wā }

superimposed back pressure [MECH ENG] The static pressure at the outlet of an operating pressure relief device, resulting from pressure in the discharge system. { ¦sü·pər·im'pōzd 'bak ,presh·ər }

superinsulation [CHEM ENG] A multilayer insulation for cryogenic systems, composed of many floating radiation shields in an evacuated double-wall annulus, closely spaced but thermally separated by a poor-conducting fiber. { ¦sü·pər,in·sə'lā·shən }

superlattice [ELECTR] A structure consisting of alternating layers of two different semiconductor materials, each several nanometers thick. { ¦sü·pər'lad·əs }

supernatant liquor [ENG] The liquid above settled solids, as in a gravity separator. { ¦sü·pər'nāt·ənt 'lik·ər }

superposition integral [CONT SYS] An integral which expresses the response of a linear system to some input in terms of the impulse response or step response of the system; it may be thought of as the summation of the responses to impulses or step functions occurring at various times. { ,sü·pər·pə'zish·ən 'int·ə·grəl }

superposition principle *See* principle of superposition. { ,sü·pər·pə'zish·ən 'prin·sə·pəl }

superposition theorem *See* principle of superposition. { ,sü·pər·pə'zish·ən 'thir·əm }

supersonic compressor [MECH ENG] A compressor in which a supersonic velocity is imparted to the fluid relative to the rotor blades,

the stator blades, or both, producing oblique shock waves over the blades to obtain a high-pressure rise. { ¦sü·pər¦sän·ik kəm'pres·ər }

supersonic diffuser [MECH ENG] A diffuser designed to reduce the velocity and to increase the pressure of fluid moving at supersonic velocities. { ¦sü·pər¦sän·ik di'fyü·zər }

supersonic nozzle *See* convergent-divergent nozzle. { ¦sü·pər¦sän·ik 'näz·əl }

superstructure [CIV ENG] The part of a structure that is raised on the foundation. { 'sü·pər ˌstrək·chər }

supertweeter [ENG ACOUS] A loudspeaker designed to reproduce extremely high audio frequencies, extending into the ultrasonic range, generally used in conjunction with a crossover network, a tweeter, and a woofer. { 'süp·ər ˌtwēd·ər }

supervisory control [ENG] A control panel or room showing key readings or indicators (temperature, pressure, or flow rate) from an entire operating area, allowing visual supervision and control of the overall operation. { ¦sü·pər¦vīz·ə·rē kən'trōl }

supervisory control and data acquisition [ENG] A version of telemetry commonly used in wide-area industrial applications, such as electrical power generation and distribution and water distribution, which includes supervisory control of remote stations as well as data acquisition from those stations over a bidirectional communications link. Abbreviated SCADA. { ˌsü·pər¦vīz·ə·rē kənˌtrōl ən 'dad·ə ˌak·wəˌzish·ən }

supervisory controlled manipulation [ENG] A form of remote manipulation in which a computer enables the operator to teach the manipulator motion patterns to be remembered and repeated later. { ¦sü·pər¦vīz·ə·rē kən'trōld mə ˌnip·yə'lā·shən }

supervisory expert control system [CONT SYS] A control system in which an expert system is used to supervise a set of control, identification, and monitoring algorithms. { ˌsü·pər¦vīz·ə·rē ˌekˌspərt kənˈtrōl ˌsis·təm }

supervoltage [ELEC] A voltage in the range of 500 to 2000 kilovolts, used for some x-ray tubes. { ¦sü·pər'vōl·tij }

supination [CONT SYS] The orientation and motion of a robot component with its front or unprotected side facing upward and exposed. { ˌsü·pə'nā·shən }

supplied-air respirator [ENG] An atmospheric-supplying device which provides the wearer with respirable air from a source outside the contaminated area; only those with manual or motor-operated blowers are approved for immediately harmful or oxygen-deficient atmospheres. { sə'plīd ¦er 'res·pəˌrād·ər }

supply chain management [IND ENG] An inventory process involving planning and processing orders; handling; transporting and storing all materials purchased, processed, or distributed; and managing inventories in a coordinated manner among all the players on the chain to fulfill customer orders as they arise rather than to build up stock level to fulfill anticipated future demand. { sə'plī ˌchān ˌman·ij·mənt }

supply control [IND ENG] The process by which an item of supply is controlled within the supply system, including requisitioning receipt, storage, stock control, shipment, disposition, identification, and accounting. { sə'plī kənˌtrōl }

supply voltage [ELEC] The voltage obtained from a power source for operation of a circuit or device. { sə'plī ˌvōl·tij }

support base [ENG] A place from which logistic support is provided for a group of launch complexes and their control center. { sə'pȯrt ˌbās }

supported end [MECH] An end of a structure, such as a beam, whose position is fixed but whose orientation may vary; for example, an end supported on a knife-edge. { sə'pȯrd·əd ˌend }

suppressed-zero instrument [ENG] An indicating or recording instrument in which the zero position is below the lower end of the scale markings. { sə'prest ¦zir·ō ˌin·strə·mənt }

suppression [ELECTR] Elimination of any component of an emission, as a particular frequency or group of frequencies in an audio-frequency of a radio-frequency signal. { sə'presh·ən }

suppressor [ELEC] **1.** In general, a device used to reduce or eliminate noise or other signals that interfere with the operation of a communication system, usually at the noise source. **2.** Specifically, a resistor used in series with a spark plug or distributor of an automobile engine or other internal combustion engine to suppress spark noise that might otherwise interfere with radio reception. *See* suppressor grid. { sə'pres·ər }

surcharge [CIV ENG] The load supported above the level of the top of a retaining wall. { 'sərˌchärj }

surcharged wall [CIV ENG] A retaining wall with an embankment on the top. { 'sərˌchärjd 'wȯl }

surface [ENG] The outer part (skin with a thickness of zero) of a body; can apply to structures, to micrometer-sized particles, or to extended-surface zeolites. { 'sər·fəs }

surface analyzer [ENG] An instrument that measures or records irregularities in a surface by moving the stylus of a crystal pickup or similar device over the surface, amplifying the resulting voltage, and feeding the output voltage to an indicator or recorder that shows the surface irregularities magnified as much as 50,000 times. { 'sər·fəs ˌan·əˌlīz·ər }

surface area [ENG] Measurement of the extent of the area (without allowance for thickness) covered by a surface. { 'sər·fəs ˌer·ē·ə }

surface barrier [ELECTR] A potential barrier formed at a surface of a semiconductor by the trapping of carriers at the surface. { 'sər·fəs ˌbar·ē·ər }

surface-barrier diode [ELECTR] A diode utilizing thin-surface layers, formed either by deposition of metal films or by surface diffusion, to serve as a rectifying junction. { 'sər·fəs ¦bar·ē·ər 'dīˌōd }

surface-barrier transistor [ELECTR] A transistor in which the emitter and collector are formed

on opposite sides of a semiconductor wafer, usually made of *n*-type germanium, by training two jets of electrolyte against its opposite surfaces to etch and then electroplate the surfaces. { 'sər·fəs ¦bar·ē·ər tran'zis·tər }

surface burning *See* glowing combustion. { 'sər·fəs ˌbərn·iŋ }

surface carburetor [MECH ENG] A carburetor in which air is passed over the surface of gasoline to charge it with fuel. { 'sər·fəs 'kär·bəˌrād·ər }

surface-charge transistor [ELECTR] An integrated-circuit transistor element based on controlling the transfer of stored electric charges along the surface of a semiconductor. { 'sər·fəs ¦chärj tran'zis·tər }

surface combustion [ENG] Combustion brought about near the surface of a heated refractory material by forcing a mixture of air and combustible gases through it or through a hole in it, or having the gas impinge directly upon it; used in muffles, crucibles, and certain types of boiler furnaces. { 'sər·fəs kəmˌbəs·chən }

surface condenser [MECH ENG] A heat-transfer device used to condense a vapor, usually steam under vacuum, by absorbing its latent heat in cooling fluid, ordinarily water. { 'sər·fəs kənˌden·sər }

surface-controlled avalanche transistor [ELECTR] Transistor in which avalanche breakdown voltage is controlled by an external field applied through surface-insulating layers, and which permits operation at frequencies up to the 10-gigahertz range. { 'sər·fəs kən¦trōld 'av·əˌlanch tranˌzis·tər }

surface-effect ship [MECH ENG] A transportation device with fixed side walls, which is supported by low-pressure, low-velocity air and operates on water only. { 'sər·fəs i¦fekt ˌship }

surface finish [ENG] The surface roughness of a component after final treatment, measured by a surface profile. { 'sər·fəs ˌfin·ish }

surface force [MECH] An external force which acts only on the surface of a body; an example is the force exerted by another object with which the body is in contact. { 'sər·fəs ˌfȯrs }

surface gage [DES ENG] **1.** A scribing tool in an adjustable stand, used to mark off castings and to test the flatness of surfaces. **2.** A gage for determining the distances of points on a surface from a reference plane. { 'sər·fəs ˌgāj }

surface grinder [MECH ENG] A grinding machine that produces a plane surface. { 'sər·fəs ˌgrīn·dər }

surface ignition [ENG] The initiation of a flame in the combustion chamber of an automobile engine by any hot surface other than the spark discharge. { 'sər·fəs igˌnish·ən }

surface leakage [ELEC] The passage of current over the surface of an insulator. { 'sər·fəs ˌlē·kij }

surface micromachining [ENG] A set of processes based upon deposition, patterning, and selective etching of thin films to form a free-standing microsensor on the surface of a silicon wafer. { ¦sər·fəs ˌmī·krə·məˈshēn·iŋ }

surface-mount technology [ELECTR] The technique of mounting electronic circuit components and their electrical connections on the surface of a printed board, rather than through holes. { 'sər·fəs ¦maůnt tekˈnäl·ə·jē }

surface noise [ELECTR] The noise component in the electric output of a phonograph pickup due to irregularities in the contact surface of the groove. Also known as needle scratch. { 'sər·fəs ˌnȯiz }

surface of section *See* Poincaré surface of section. { ¦sər·fəs əv 'sek·shən }

surface passivation [ELECTR] A method of coating the surface of a *p*-type wafer for a diffused junction transistor with an oxide compound, such as silicon oxide, to prevent penetration of the impurity in undesired regions. { 'sər·fəs ˌpas·əˈvā·shən }

surface-penetrating radar *See* ground-probing radar. { ˌsər·fəs ˌpen·əˌtrād·iŋ 'rāˌdär }

surface planer *See* surfacer. { 'sər·fəs ˌplā·nər }

surface plate [DES ENG] A plate having a very accurate plane surface used for testing other surfaces or to provide a true surface for accurately measuring and locating testing fixtures. { 'sər·fəs ˌplāt }

surfacer [DES ENG] A machine that is used to dress or plane the surface of a material such as stone, metal, or wood. Also known as surface planer. { 'sər·fəs·ər }

surface resistivity [ELEC] The electric resistance of the surface of an insulator, measured between the opposite sides of a square on the surface; the value in ohms is independent of the size of the square and the thickness of the surface film. { 'sər·fəs ˌrēˌzisˈtiv·əd·ē }

surface roughness [ENG] The closely spaced unevenness of a solid surface (pits and projections) that results in friction for solid-solid movement or for fluid flow across the solid surface. { 'sər·fəs ˌrəf·nəs }

surface-set bit [DES ENG] A bit containing a single layer of diamonds set so that the diamonds protrude on the surface of the crown. Also known as single-layer bit. { 'sər·fəs ¦set ˌbit }

surface sizing *See* sizing treatment. { 'sər·fəs ˌsīz·iŋ }

surface thermometer [ENG] A thermometer, mounted in a bucket, used to measure the temperature of the sea surface. { 'sər·fəs thərˈmäm·əd·ər }

surface treating [ENG] Any method of treating a material (metal, polymer, or wood) so as to alter the surface, rendering it receptive to inks, paints, lacquers, adhesives, and various other treatments, or resistant to weather or chemical attack. { 'sər·fəs ˌtrēd·iŋ }

surface vibrator [MECH ENG] A vibrating device used on the surface of a pavement or flat slab to consolidate the concrete. { 'sər·fəs ˌvī,brād·ər }

surface waterproofing [ENG] Waterproofing concrete by painting a waterproofing liquid on the surface. { 'sər·fəs 'wȯd·ər ˌprüf·iŋ }

surface wave *See* Rayleigh wave. { 'sər·fəs ˌwāv }

surfacing mat *See* overlay. { 'sər·fə·siŋ ˌmat }

surge [ELEC] A momentary large increase in the current or voltage in an electric circuit. [ENG] **1.** An upheaval of fluid in a processing system, frequently causing a carryover (puking) of liquid through the vapor lines. **2.** The peak system pressure. **3.** An unstable pressure buildup in a plastic extruder leading to variable throughput and waviness of the hollow plastic tube. { sərj }

surge arrester [ELEC] A protective device designed primarily for connection between a conductor of an electrical system and ground to limit the magnitude of transient overvoltages on equipment. Also known as arrester; lightning arrester. { 'sərj əˌres·tər }

surge current [ELEC] A short-duration, high-amperage electric current wave that may sweep through an electrical network, as a power transmission network, when some portion of it is strongly influenced by the electrical activity of a thunderstorm. { 'sərj ˌkə·rənt }

surge protector [ELEC] A device placed in an electrical circuit to prevent the passage of surges and spikes that could damage electronic equipment. { 'sərj prəˌtek·tər }

surge stress [MECH] The physical stress on process equipment or systems resulting from a sudden surge in fluid (gas or liquid) flow rate or pressure. { 'sərj ˌstres }

surge suppressor [ELECTR] A circuit that responds to the rate of change of a current or voltage to prevent a rise above a predetermined value; it may include resistors, capacitors, coils, gas tubes, and semiconducting disks. Also known as transient suppressor. { 'sərj səˌpres·ər }

surge tank [ENG] **1.** A standpipe or storage reservoir at the downstream end of a closed aqueduct or feeder pipe, as for a water wheel, to absorb sudden rises of pressure and to furnish water quickly during a drop in pressure. Also known as surge drum. **2.** An open tank to which the top of a surge pipe is connected so as to avoid loss of water during a pressure surge. { 'sərj ˌtaŋk }

surging [ENG] Motion of a ship that alternately moves forward and aft, usually when moored. { 'sərj·iŋ }

surveillance [ENG] Systematic observation of air, surface, or subsurface areas or volumes by visual, electronic, photographic, or other means, for intelligence or other purposes. { sər'vā·ləns }

survey [ENG] **1.** The process of determining accurately the position, extent, contour, and so on, of an area, usually for the purpose of preparing a chart. **2.** The information so obtained. { 'sərˌvā }

survey foot [MECH] A unit of length, used by the U.S. Coast and Geodetic Survey, equal to 12/39.37 meter, or approximately 1.000002 feet. { 'sərˌvā 'fůt }

surveying altimeter [ENG] A barometric-type instrument consisting of a pressure-sensitive element which contracts or expands in proportion to atmospheric pressure, connected through a linkage to a pointer; its dial is graduated in units of linear measurement (feet or meters) to indicate differences of elevation only. { sər'vā·iŋ al'tim·əd·ər }

surveying sextant *See* hydrographic sextant. { sər'vā·iŋ ˌseks·tənt }

surveyor's compass [ENG] An instrument used to measure horizontal angles in surveying. { sər'vā·ərz ˌkäm·pəs }

surveyor's cross [ENG] An instrument for setting out right angles in surveying; consists of two bars at right angles with sights at each end. { sər'vā·ərz ˌkrȯs }

surveyor's level [ENG] A telescope and spirit level mounted on a tripod, rotating vertically and having leveling screws for adjustment. { sər'vā·ərz ˌlev·əl }

surveyor's measure [ENG] A system of measurement used in surveying having the engineer's, or Gunter's chain, as a unit. { sər'vā·ərz ˌmezh·ər }

survey traverse *See* traverse. { 'sərˌvā traˌvərs }

survivor curve [IND ENG] A curve showing the percentage of a group of machines or facilities surviving at a given age. { sər'vī·vər ˌkərv }

Surwell clinograph [ENG] A directional surveying instrument which records photographically the direction and magnitude of well deviations from the vertical; powered by batteries, it contains a box level gage (indicating vertical deviation), a gyroscopic compass (indicating azimuth direction) and a watch and a dial thermometer, so that a simultaneous record of amount and direction of deviation, temperature, and time can be made on 16-millimeter film. { 'sərˌwel 'klīn·əˌgraf }

susceptance [ELEC] The imaginary component of admittance. { sə'sep·təns }

susceptance standard [ELEC] Standard that introduces calibrated small values of shunt capacitance into 50-ohm coaxial transmission arrays. { sə'sep·təns ˌstan·dərd }

susceptibility *See* electric susceptibility. { səˌsep·tə'bil·əd·ē }

susceptometer [ENG] An instrument that measures paramagnetic, diamagnetic, or ferromagnetic susceptibility. { ˌsə'sep'täm·əd·ər }

suspended acoustical ceiling [BUILD] An acoustical ceiling which is suspended from either the roof or a higher ceiling. { sə'spen·dəd ə'kü·stə·kəl 'sē·liŋ }

suspended ceiling [BUILD] The suspension of the furring members beneath the structural members of a ceiling. { sə'spen·dəd 'sē·liŋ }

suspended formwork [CIV ENG] Formwork suspended from supports for the floor being cast. { sə'spen·dəd 'fȯrmˌwərk }

suspended span [CIV ENG] A simple span supported from the free ends of cantilevers. { sə'spen·dəd 'span }

suspended transformation [THERMO] The cessation of change before true equilibrium is

reached, or the failure of a system to change immediately after a change in conditions, such as in supercooling and other forms of metastable equilibrium. { sə'spen·dəd ˌtranz·fər 'mā·shən }

suspended tray conveyor [MECH ENG] A vertical conveyor having pendant trays or other carriers on one or more endless chains. { sə'spen·dəd ˈtrā kən'vā·ər }

suspension [ENG] A fine wire or coil spring that supports the moving element of a meter. { sə'spen·shən }

suspension bridge [CIV ENG] A fixed bridge consisting of either a roadway or a truss suspended from two cables which pass over two towers and are anchored by backstays to a firm foundation. { sə'spen·shən ˌbrij }

suspension cable [ENG] A freely hanging cable; may carry mainly its own weight or a uniformly distributed load. { sə'spen·shən ˌkā·bəl }

suspension roof [BUILD] A roof that is supported by steel cables. { sə'spen·shən ˌrüf }

suspension system [MECH ENG] A system of springs, shock absorbers, and other devices supporting the upper part of a motor vehicle on its running gear. { sə'spen·shən ˌsis·təm }

sustainable development [ENG] Development of industrial and natural resources that meets the energy needs of the present without compromising the ability of future generations to meet their needs in a similar manner. { səˌstān·ə·bəl di'vel·əp·mənt }

sustained oscillation [CONT SYS] Continued oscillation due to insufficient attenuation in the feedback path. { sə'stānd ˌäs·ə'lā·shən }

Sutro weir [CIV ENG] A dam with at least one curved side and horizontal crest, so formed that the head above the crest is directly proportional to the discharge. { 'sü·trō ˌwer }

SV *See* speaker verification.

swage bolt [DES ENG] A bolt having indentations with which it can be gripped in masonry. { 'swāj ˌbōlt }

swallow buoy *See* swallow float. { 'swä·lō ˌbōi }

swallow float [ENG] A tubular buoy used to measure current velocities; it can be adjusted to be neutrally buoyant and to drift at a selected density level while being tracked by shipboard listening devices. Also known as neutrally buoyant float; swallow buoy. { 'swä·lō ˌflōt }

swamp buggy [MECH ENG] A wheeled vehicle that runs on sand, on mud, or through shallow water; used especially in swamps. { 'swämp ˌbəg·ē }

swamping resistor [ELECTR] Resistor placed in the emitter lead of a transistor circuit to minimize the effects of temperature on the emitter-base junction resistance. { 'swämp·iŋ riˌzis·tər }

swarf [ENG] Chips, shavings, and other fine particles removed from the workpiece by grinding tools. { 'swȯrf }

swash-plate pump [MECH ENG] A rotary pump in which the angle between the drive shaft and the plunger-carrying body is varied. { swäsh ˈplāt ˌpəmp }

sway bar *See* stabilizer bar. { 'swā ˌbär }

sway brace [CIV ENG] One or a pair of diagonal members designed to resist horizontal forces, such as wind. { 'swā ˌbrās }

sway frame [CIV ENG] A unit in the system of members of a bridge that provides bracing against side sway; consists of two diagonals, the verticals, the floor beam, and the bottom strut. { 'swā ˌfrām }

sweating [CHEM ENG] Separation of paraffin oil from low-melting petroleum wax obtained from paraffin wax in a chamber (sweater) by first cooling the mixture until it is a solid cake, then warming gradually to cause partial fusion of the mixture to allow drainage of liquid from the cake. Also known as exudation. { 'swed·iŋ }

sweetening [CHEM ENG] Improvement of a petroleum-product color and odor by converting sulfur compounds into disulfides with sodium plumbite (doctor treating), or by removing them by contacting the petroleum stream with alkalies or other sweetening agents. { 'swēt·ən·iŋ }

swing [ELEC] Variation in frequency or amplitude of an electrical quantity. [ENG] **1.** The arc or curve described by the point of a pick or mandril when being used. **2.** Rotation of the superstructure of a power shovel on the vertical shaft in the mounting. **3.** To rotate a revolving shovel on its base. { swiŋ }

swing bridge [CIV ENG] A movable bridge that pivots in a horizontal plane about a center pier. { 'swiŋ ˌbrij }

swing-frame grinder [MECH ENG] A grinding machine hanging by a chain so that it may swing in all directions for surface grinding heavy work. { 'swiŋ ˌfrām ˌgrīn·dər }

swinging load [ENG] The load in pressure equipment which changes at frequent intervals. { 'swiŋ·iŋ 'lōd }

swing joint [DES ENG] A pipe joint in which the parts may be rotated relative to each other. { 'swiŋ ˌjȯint }

swing pipe [ENG] A discharge pipe whose intake end can be raised or lowered on a tank. { 'swiŋ ˌpīp }

swing shift [IND ENG] Working arrangement in a three-shift, continuously run plant with working hours changed at regular intervals; during a swing shift the morning shift becomes the afternoon shift, while the afternoon shift becomes the morning shift of the next day, with only an 8-hour break on the first day of change. { 'swiŋ ˌshift }

swirl flowmeter *See* vortex precession flowmeter. { 'swərl 'flōˌmēd·ər }

Swiss pattern file [DES ENG] A type of fine file used for precision filing of jewelry, instrument parts, and dies. { 'swis ˈpad·ərn 'fīl }

switch [CIV ENG] **1.** A device for enabling a railway car to pass from one track to another. **2.** The junction of two tracks. [ELEC] A manual or mechanically actuated device for making,

breaking, or changing the connections in an electric circuit. Also known as electric switch. Symbolized SW. { swich }

switch angle [CIV ENG] The angle between the switch and stock rails of a railroad track, measured at the point of juncture between the gage lines. { 'swich ˌaŋ·gəl }

switchblade knife [DES ENG] A knife in which the blade is spring-loaded and swings open when released by a pushbutton. { 'swichˌblād 'nīf }

switched capacitor [ELECTR] An integrated circuit element, consisting of a capacitor with two metal oxide semiconductor (MOS) switches, whose function is approximately equivalent to that of a resistor. { 'swicht kə'pas·əd·ər }

switch function [ELECTR] A circuit having a fixed number of inputs and outputs designed such that the output information is a function of the input information, each expressed in a certain code or signal configuration or pattern. { 'swich ˌfəŋk·shən }

switching [ELEC] Making, breaking, or changing the connections in an electrical circuit. { 'swich·iŋ }

switching circuit [ELEC] A constituent electric circuit of a switching or digital processing system which receives, stores, or manipulates information in coded form to accomplish the specified objectives of the system. { 'swich·iŋ ˌsər·kət }

switching device [ENG] An electrical or mechanical device or mechanism, which can bring another device or circuit into an operating or nonoperating state. Also known as switching mechanism. { 'swich·iŋ diˌvīs }

switching diode [ELECTR] A crystal diode that provides essentially the same function as a switch; below a specified applied voltage it has high resistance corresponding to an open switch, while above that voltage it suddenly changes to the low resistance of a closed switch. { 'swich·iŋ ˌdīˌōd }

switching gate [ELECTR] An electronic circuit in which an output having constant amplitude is registered if a particular combination of input signals exists; examples are the OR, AND, NOT, and INHIBIT circuits. Also known as logical gate. { 'swich·iŋ ˌgāt }

switching key *See* key. { 'swich·iŋ ˌkē }

switching mechanism *See* switching device. { 'swich·iŋ ˌmek·əˌniz·əm }

switching substation [ELEC] An electric power substation whose equipment is mainly for connections and interconnections, and does not include transformers. { 'swich·iŋ 'səbˌstā·shən }

switching surface [CONT SYS] In feedback control systems employing bang-bang control laws, the surface in state space which separates a region of maximum control effort from one of minimum control effort. { 'swich·iŋ ˌsər·fəs }

switching-through relay [ELEC] Control relay of a line-finder selector, connector, or other stepping switch, which extends the loop of a calling telephone through to the succeeding switch in a switch train. { 'swich·iŋ ˈthrü 'rēˌlā }

switching time [ELECTR] **1.** The time interval between the reference time and the last instant at which the instantaneous voltage response of a magnetic cell reaches a stated fraction of its peak value. **2.** The time interval between the reference time and the first instant at which the instantaneous integrated voltage response of a magnetic cell reaches a stated fraction of its peak value. { 'swich·iŋ ˌtīm }

switching transistor [ELECTR] A transistor designed for on/off switching operation. { 'swich·iŋ tranˈzis·tər }

switching trunk [ELEC] Trunk from a long-distance office to a local exchange office used for completing a long-distance call. { 'swich·iŋ ˌtraŋk }

switch jack [ELEC] Any of the devices that provide terminals for the control circuits of the switch. { 'swich ˌjak }

swivel [DES ENG] A part that oscillates freely on a headed bolt or pin. { 'swiv·əl }

swivel block [DES ENG] A block with a swivel attached to its hook or shackle permitting it to revolve. { 'swiv·əl ˌbläk }

swivel coupling [MECH ENG] A coupling that gives complete rotary freedom to a deflecting wedge-setting assembly. { 'swiv·əl ˌkəp·liŋ }

swivel head [MECH ENG] The assembly of a spindle, chuck, feed nut, and feed gears on a diamond-drill machine that surrounds, rotates, and advances the drill rods and drilling stem; on a hydraulic-feed drill the feed gears are replaced by a hydraulically actuated piston assembly. { 'swiv·əl ˌhed }

swivel hook [DES ENG] A hook with a swivel connection to its base or eye. { 'swiv·əl ˌhůk }

swivel joint [DES ENG] A joint with a packed swivel that allows one part to move relative to the other. { 'swiv·əl ˌjȯint }

swivel neck *See* water swivel. { 'swiv·əl ˌnek }

swivel pin *See* kingpin. { 'swiv·əl ˌpin }

swivel spindle [BUILD] A shaft in a door handle assembly designed with a center joint that permits one knob to remain fixed while the other is being turned. { 'swiv·əl ˌspin·dəl }

symballophone [ENG] A double stethoscope for the comparison and lateralization of sounds; permits the use of the acute function of the two ears to compare intensity and varying quality of sounds arising in the body or mechanical devices. { simˈbȯl·əˌfōn }

symmetrical avalanche rectifier [ELECTR] Avalanche rectifier that can be triggered in either direction, after which it has a low impedance in the triggered direction. { sə'me·trə·kəl 'av·əˌlanch ˌrek·təˌfī·ər }

symmetrical band-pass filter [ELECTR] A band-pass filter whose attenuation as a function of frequency is symmetrical about a frequency at the center of the pass band. { sə'me·trə·kəl 'band ˌpas ˌfil·tər }

symmetrical band-reject filter [ELECTR] A band-rejection filter whose attenuation as a

function of frequency is symmetrical about a frequency at the center of the rejection band. { sə'me·trə·kəl 'band ri,jekt ,fil·tər }

symmetrical clipper [ELECTR] A clipper in which the upper and lower limits on the amplitude of the output signal are positive and negative values of equal magnitude. { sə'me·trə·kəl 'klip·ər }

symmetrical deflection [ELECTR] A type of electrostatic deflection in which voltages that are equal in magnitude and opposite in sign are applied to the two deflector plates. { sə'me·trə·kəl di'flek·shən }

symmetrical H attenuator [ELECTR] An H attenuator in which the impedance near the input terminals equals the corresponding impedance near the output terminals. { sə'me·trə·kəl 'āch ə,ten·yə'wād·ər }

symmetrical O attenuator [ELECTR] An O attenuator in which the impedance near the input terminals equals the corresponding impedance near the output terminals. { sə'me·trə·kəl 'ō ə,ten·yə,wād·ər }

symmetrical pi attenuator [ELECTR] A pi attenuator in which the impedance near the input terminals equals the corresponding impedance near the output terminals. { sə'me·trə·kəl 'pī ə,ten·yə,wād·ər }

symmetrical T attenuator [ELECTR] A T attenuator in which the impedance near the input terminals equals the corresponding impedance near the output terminals. { sə'me·trə·kəl 'tē ə,ten·yə,wād·ər }

symmetrical transducer [ELECTR] A transducer is symmetrical with respect to a specified pair of terminations when the interchange of that pair of terminations will not affect the transmission. { sə'me·trə·kəl tranz'dü·sər }

symmetry axis *See* axis of symmetry. { 'sim·ə,trē ,ak·səs }

sympathetic detonation [ENG] Explosion caused by the transmission of a detonation wave through any medium from another explosion. { ,sim·pə'thed·ik ,det·ən'ā·shən }

sync *See* synchronization. { siŋk }

synchro [ELEC] Any of several devices which are used for transmitting and receiving angular position or angular motion over wires, such as a synchro transmitter or synchro receiver. Also known as mag-slip (British usage); self-synchronous device; self-synchronous repeater; selsyn. { 'siŋ·krō }

synchromesh [MECH ENG] An automobile transmission device that minimizes clashing; acts as a friction clutch, bringing gears approximately to correct speed just before meshing. { 'siŋ·krō,mesh }

synchronization [ENG] The maintenance of one operation in step with another, as in keeping the electron beam of a television picture tube in step with the electron beam of the television camera tube at the transmitter. Also known as sync. { ,siŋ·krə·nə'zā·shən }

synchronization indicator [ENG] An indicator that presents visually the relationship between two varying quantities or moving objects. { ,siŋ·krə·nə'zā·shən ,in·də,kād·ər }

synchronized shifting [MECH ENG] Changing speed gears, with the gears being brought to the same speed before the change can be made. { 'siŋ·krə,nīzd 'shift·iŋ }

synchronous [ENG] In step or in phase, as applied to two or more circuits, devices, or machines. { 'siŋ·krə·nəs }

synchronous belt *See* timing belt. { 'siŋ·krə·nəs 'belt }

synchronous gate [ELECTR] A time gate in which the output intervals are synchronized with an incoming signal. { 'siŋ·krə·nəs 'gāt }

synchroscope [ELECTR] A cathode-ray oscilloscope designed to show a short-duration pulse by using a fast sweep that is synchronized with the pulse signal to be observed. [ENG] An instrument for indicating whether two periodic quantities are synchronous; the indicator may be a rotating-pointer device or a cathode-ray oscilloscope providing a rotating pattern; the position of the rotating pointer is a measure of the instantaneous phase difference between the quantities. { 'siŋ·krə,skōp }

synchro-shutter [ENG] A camera shutter with a circuit that flashes a light the instant the shutter opens. { 'siŋ·krō ,shəd·ər }

syngas *See* synthesis gas. { 'sin,gas }

syntactic semigroup [SYS ENG] For a sequential machine, the set of all transformations performed by all input sequences. { sin'tak·tik 'sem·i,grüp }

synthesis *See* system design. { 'sin·thə·səs }

synthesis gas [CHEM ENG] A mixture of gases prepared as feedstock for a chemical reaction, for example, carbon monoxide and hydrogen to make hydrocarbons or organic chemicals, or hydrogen and nitrogen to make ammonia. Also known as syngas. { 'sin·thə·səs ,gas }

synthetic aperture [ENG] A method of increasing the ability of an imaging system, such as radar or acoustical holography, to resolve small details of an object, in which a receiver of large size (or aperture) is in effect synthesized by the motion of a smaller receiver and the proper correlation of the detected signals. { sin'thed·ik 'ap·ə·chər }

synthetic-aperture radar [ENG] A radar system in which an aircraft moving along a very straight path emits microwave pulses continuously at a frequency constant enough to be coherent for a period during which the aircraft may have traveled about 1 kilometer; all echoes returned during this period can then be processed as if a single antenna as long as the flight path had been used. { sin'thed·ik ¦ap·ə·chər 'rā,där }

synthetic data [IND ENG] Any production data applicable to a given situation that are not obtained by direct measurement. { sin'thed·ik 'dad·ə }

synthol process [CHEM ENG] A reaction of carbon monoxide and hydrogen with an iron and sodium carbonate catalyst; produces a mixture of higher alcohols, aldehydes, ketones, higher

fatty acids, and aliphatic hydrocarbons, usable as a synthetic gasoline. { 'sinˌthōl ˌprä·səs }

syntony [ELEC] Condition in which two oscillating circuits have the same resonant frequency. { 'sin·tə·nē }

system [ELECTR] A combination of two or more sets generally physically separated when in operation, and such other assemblies, subassemblies, and parts necessary to perform an operational function or functions. [ENG] A combination of several pieces of equipment integrated to perform a specific function; thus a fire control system may include a tracking radar, computer, and gun. { 'sis·təm }

system analysis [CONT SYS] The use of mathematics to determine how a set of interconnected components whose individual characteristics are known will behave in response to a given input or set of inputs. { 'sis·təm əˌnal·ə·səs }

systematic error [ENG] An error due to some known physical law by which it might be predicted; these errors produced by the same cause affect the mean in the same sense, and do not tend to balance each other but rather give a definite bias to the mean. { ˌsis·tə'mad·ik 'er·ər }

system bandwidth [CONT SYS] The difference between the frequencies at which the gain of a system is $\sqrt{2}/2$ (that is, 0.707) times its peak value. { 'sis·təm 'bandˌwidth }

system design [CONT SYS] A technique of constructing a system that performs in a specified manner, making use of available components. Also known as synthesis. { 'sis·təm di'zīn }

system effectiveness [ENG] A measure of the extent to which a system may be expected to achieve a set of specific mission requirements expressed as a function of availability, dependability, and capability. { 'sis·təm i'fek·tiv·nəs }

system engineering *See* systems engineering. { 'sis·təm ˌen·jə'nir·iŋ }

system life cycle [ENG] The continuum of phases through which a system passes from conception through disposition. { 'sis·təm 'līf ˌsī·kəl }

system optimization *See* optimization. { 'sis·təm ˌäp·tə·mə'zā·shən }

system reliability [ENG] The probability that a system will accurately perform its specified task under stated environmental conditions. { 'sis·təm riˌlī·ə'bil·əd·ē }

system safety [ENG] The optimum degree of safety within the constraints of operational effectiveness, time, and cost, attained through specific application of system safety engineering throughout all phases of a system. { 'sis·təm 'sāf·tē }

system safety engineering [ENG] An element of systems management involving the application of scientific and engineering principles for the timely identification of hazards, and initiation of those actions necessary to prevent or control hazards within the system. { 'sis·təm 'sāf·tē ˌen·jəˌnir·iŋ }

systems analysis [ENG] The analysis of an activity, procedure, method, technique, or business to determine what must be accomplished and how the necessary operations may best be accomplished. { 'sis·təmz əˌnal·ə·səs }

systems architecting [SYS ENG] The discipline that combines elements which, working together, create unique structural and behavioral capabilities in a system that none could produce alone. Also known as systems architecture. { ¦sis·təmz 'ärˌkəˌtek·tiŋ }

systems architecture *See* systems architecting. { 'sis·təmz ˌärˌkəˌtek·chər }

systems engineering [ENG] The design of a complex interrelation of many elements (a system) to maximize an agreed-upon measure of system performance, taking into consideration all of the elements related in any way to the system, including utilization of worker power as well as the characteristics of each of the system's components. Also known as system engineering. { 'sis·təmz ˌen·jəˌnir·iŋ }

systems implementation test [ENG] The test program that exercises the complete system in its actual environment to determine its capabilities and limitations; this test also demonstrates that the system is functionally operative, and is compatible with the other subsystems and supporting elements required for its operational employment. { 'sis·təmz ˌim·plə·mən'tā·shən ˌtest }

systems integration [SYS ENG] A discipline that combines processes and procedures from systems engineering, systems management, and product development for the purpose of developing large-scale complex systems that involve hardware and software and may be based on existing or legacy systems coupled with totally new requirements to add significant functionality. { ¦sis·təmz ˌin·tə'grā·shən }

systems-management reengineering *See* organizational reengineering. { ¦sis·təmz ˌman·ij·mənt ˌrēˌen·jə'nir·iŋ }

systems test [ENG] A test of an entire interconnected set of components for the purpose of determining proper functions and interconnections. { 'sis·təmz ˌtest }

Szechtman cell [CHEM ENG] An electrolytic process for manufacture of chlorine that is a variation of both the mercury cell and molten salt cell. { 'sekt·mən ˌsel }

T

t *See* troy system.

tab-card cutter [DES ENG] A device for die-cutting card stock to uniform tabulating-card size. { 'tab ¦kärd ˌkəd·ər }

table [BUILD] A horizontal projection or molding on the exterior or interior face of a wall. [MECH ENG] That part of a grinding machine which directly or indirectly supports the work being ground. { 'tā·bəl }

tabled joint [CIV ENG] In cut stonework, a bed joint formed by a broad, shallow channel in the surface of one stone that fits a corresponding projection of the stone above or below. { 'tā·bəld ˌjȯint }

tablespoonful [MECH] A unit of volume used particularly in cookery, equal to 4 fluid drams or 1/2 fluid ounce; in the United States this is equal to approximately 14.7868 cubic centimeters, in the United Kingdom to approximately 14.2065 cubic centimeters. Abbreviated tbsp. { 'tā·bəl¦spün,fůl }

tableting [ENG] A punch-and-die procedure for the compaction of powdered or granular solids; used for pharmaceuticals, food products, fireworks, vitamins, and dyes. { 'tab·ləd·iŋ }

tabling [BUILD] Formation of a horizontal masonry joint by arranging building stones in a course so that they extend into the next course and thus prevent slippage. { 'tāb·liŋ }

tab stop [DES ENG] A column position to which the printing mechanism of a typewriter or computer printer advances upon receipt of a command. { 'tab ˌstäp }

tachometer [ENG] An instrument that measures the revolutions per minute or the angular speed of a rotating shaft. { tə'käm·əd·ər }

tack [DES ENG] A small, sharp-pointed nail with a broad flat head. { tak }

tack coat [CIV ENG] A thin layer of bitumen, road tar, or emulsion laid on a road to enhance adhesion of the course above it. { 'tak ˌkōt }

tackiness *See* tack. { 'tak·ē·nəs }

tackle [MECH ENG] Any arrangement of ropes and pulleys to gain a mechanical advantage. { 'tak·əl *or* 'tāk·əl (naval usage) }

tack range [ENG] The length of time during which an adhesive will remain in the tacky-dry condition after application to an adherent. { 'tak ˌrānj }

tactical aircraft shelter [CIV ENG] A shelter to house fighter-type aircraft and to provide protection to the aircraft from attack by conventional weapons, or damage from high winds or other elemental hazards. { 'tak·tə·kəl ¦er,kraft ˌshel·tər }

tactical control radar [ENG] Antiaircraft artillery radar which has essentially the same inherent capabilities as the target acquisition radar (physically it may be the same type of set) but whose function is chiefly that of providing tactical information for the control of elements of the antiaircraft artillery defenses in battle. { 'tak·tə·kəl kən'trol ˌrā,där }

tactical range recorder [ENG] A sonar device in surface ships used to plot the time-range coordinates of submarines and determine firing of depth charges. { 'tak·tə·kəl 'rānj ri,kȯrd·ər }

tactile sensor [CONT SYS] A transducer, usually associated with a robot end effector, that is sensitive to touch; comprises stress and touch sensors. { 'tak·təl 'sen·sər }

taffrail log [ENG] A log consisting essentially of a rotator towed through the water by a braided log line attached to a distance-registering device usually secured at the taffrail, the railing at the stern. Also known as patent log. { 'taf,rāl ˌläg }

Tag-Robinson colorimeter [ENG] A laboratory device used to determine the color shades of lubricating and other oils; the color, reported as a number, is determined by varying the thickness of a column of oil until its color matches that of a standard color glass. { 'tag 'räb·ən·sən ˌkə·lə'rim·əd·ər }

tailboard *See* tailgate. { 'tāl,bȯrd }

tailgate [CIV ENG] The downstream gate of a canal lock. [ENG] A hinged gate at the rear of a vehicle that can be let down for convenience in loading. Also known as tailboard. { 'tāl,gāt }

tail house [CHEM ENG] An installation in a refinery containing a look box, facilities for sampling, and controls for diverting the products to storage tanks or to other locations in the refinery for further processing. { 'tāl ˌhaůs }

tailing [BUILD] The projecting portion of a stone or brick that has been set into a wall, for example, a cornice. { tāl·iŋ }

tailings [ENG] The lighter particles which pass over a sieve in milling, crushing, or purifying operations. { 'tāl·iŋz }

tail pulley [MECH ENG] A pulley at the tail of the belt conveyor opposite the normal discharge end; may be a drive pulley or an idler pulley. { 'tāl ˌpůl·ē }

tailrace [ENG] A channel for carrying water away from a turbine, waterwheel, or other industrial application. { 'tālˌrās }

tailstock [MECH ENG] A part of a lathe that holds the end of the work not being shaped, allowing it to rotate freely. { 'tālˌstäk }

tail warning radar [ENG] Radar installed in the tail of an aircraft to warn the pilot that an aircraft is approaching from the rear. { 'tāl 'wȯrn·iŋ ˌrā,där }

Tainter gate [CIV ENG] A spillway gate whose face is a section of a cylinder; rotates about a horizontal axis on the downstream end of the gate and can be closed under its own weight. Also known as radial gate. { 'tān·tər ˌgāt }

takeup [MECH ENG] A tensioning device in a belt-conveyor system for taking up slack of loose parts. { 'tākˌəp }

takeup pulley [MECH ENG] An adjustable idler pulley to accommodate changes in the length of a conveyor belt to maintain proper belt tension. { 'tākˌəp ˌpůl·ē }

takeup reel [ENG] The reel that accumulates magnetic tape after it is recorded or played by a tape recorder. { 'tākˌəp ˌrēl }

takt time [IND ENG] **1.** The rate of customer demand, calculated by dividing the available production time by the quantity the customer requires in that time. **2.** The reciprocal of the production rate. { 'tak ˌtīm }

talk-listen switch [ENG ACOUS] A switch provided on intercommunication units to permit using the loudspeaker as a microphone when desired. { 'tȯk 'lis·ən ˌswich }

tall building [CIV ENG] A structure that, because of its height, is affected by lateral forces due to wind or earthquake to the extent that the forces constitute an important element in structural design. Also known as high-rise building. { ¦tȯl ¦bil·diŋ }

tamp [ENG] To tightly pack a drilled hole with clay or other stemming material after the charge has been placed. { tamp }

tamper [CIV ENG] A ramming device for compacting a granular material such as soil, backfill, or unformed concrete; usually powered by a motor. { 'tam·pər }

tamping bag [ENG] A bag filled with stemming material such as sand for use in horizontal and upward sloping shotholes. { 'tamp·iŋ ˌbag }

tamping bar [ENG] A piece of wood for pushing explosive cartridges or forcing the stemming into shotholes. { 'tamp·iŋ ˌbär }

tamping plug [ENG] A plug of iron or wood used instead of tamping material to close up a loaded blasthole. { 'tamp·iŋ ˌpləg }

tamping roller *See* sheepsfoot roller. { 'tamp·iŋ 'rō·lər }

tampion [ENG] A cone-shaped hand tool usually fashioned of hardwood that is forced into a lead pipe to increase its diameter. { 'tam·pē·ən }

tandem compensation *See* cascade compensation. { 'tan·dəm ˌkäm·pən'sā·shən }

tandem distributed numerical control [CONT SYS] A form of distributed numerical control involving a series of machines connected by a conveyor and automatic loading and unloading devices that are under control of the central computers. { 'tan·dəm di¦strib·yəd·əd nů¦mer·ə·kəl kən'trōl }

tandem-drive conveyor [MECH ENG] A conveyor having the conveyor belt in contact with two drive pulleys, both driven with the same motor. { 'tan·dəm ¦drīv kən'vā·ər }

tandem roller [MECH ENG] A steam- or gasoline-driven road roller in which the weight is divided between heavy metal rolls, of dissimilar diameter, one behind the other. { 'tan·dəm 'rō·lər }

tang [ENG] **1.** The part of a file that fits into a handle. **2.** The end of a drill shank which allows transmission of torque from the drill press spindle to the body of the drill. { taŋ }

tangent galvanometer [ENG] A galvanometer in which a small compass is mounted horizontally in the center of a large vertical coil of wire; the current through the coil is proportional to the tangent of the angle of deflection of the compass needle from its normal position parallel to the magnetic field of the earth. { 'tan·jənt ˌgal·və'näm·əd·ər }

tangential acceleration [MECH] The component of linear acceleration tangent to the path of a particle moving in a circular path. { tan'jen·chəl akˌsel·ə'rā·shən }

tangential helical-flow turbine *See* helical-flow turbine. { tan'jen·chəl ¦hel·ə·kəl ˌflō 'tər·bən }

tangential stress *See* shearing stress. { tan'jen·chəl 'stres }

tangential velocity [MECH] **1.** The instantaneous linear velocity of a body moving in a circular path; its direction is tangential to the circular path at the point in question. **2.** The component of the velocity of a body that is perpendicular to a line from an observer or reference point to the body. { tan'jen·chəl və'läs·əd·ē }

tangent offset [ENG] In surveying, a method of plotting traverse lines; angles are laid out by linear measurement, using a constant times the natural tangent of the angle. { 'tan·jənt 'ȯfˌset }

tangent point *See* point of tangency. { 'tan·jənt ˌpȯint }

tangent screw [ENG] A screw providing tangential movement along an arc, such as the screw which provides the final angular adjustment of a marine sextant during an observation. { 'tan·jənt ˌskrü }

tank [ELECTR] **1.** A unit of acoustic delay-line storage containing a set of channels, each forming a separate recirculation path. **2.** The heavy metal envelope of a large mercury-arc rectifier or other gas tube having a mercury-pool cathode. **3.** *See* tank circuit. [ENG] A large container for

holding, storing, or transporting a liquid. { taŋk }

tankage [ENG] Contents of a storage tank. { 'taŋ·kij }

tank balloon [ENG] An air- and vapor-tight flexible container fitted to the breather pipe of a gasoline storage tank to receive gasoline vapors; as the tank cools, the vapors return to the tank. { 'taŋk bə,lün }

tank bottom [CHEM ENG] The liquid material in a tank below the level of the outlet pipe; often a mixture of the stored liquid with rust and other sediment. { 'taŋk ˌbäd·əm }

tank car [ENG] Railroad car onto which is mounted a cylindrical, horizontal tank designed for the transport of liquids, chemicals, gases, meltable solids, slurries, emulsions, or fluidizable solids. { 'taŋk ˌkär }

tank gage [ENG] A device used to measure the contents of a liquid storage tank; can be manual or automatic. { 'taŋk ˌgāj }

tank scale [ENG] A counterweighted suspension or platform weighing mechanism for tanks, hoppers, and similar solids or liquids containers. { 'taŋk ˌskāl }

tank truck [ENG] A truck body onto which is mounted a cylindrical, horizontal tank, designed for the transport of liquids, chemicals, gases, meltable solids, slurries, emulsions, or fluidizable solids. { 'taŋk ˌtrək }

tanning [ENG] A process of preserving animal hides by chemical treatment (using vegetable tannins, metallic sulfates, and sulfurized phenol compounds, or syntans) to make them immune to bacterial attack, and subsequent treatment with fats and greases to make them pliable. { 'tan·iŋ }

tantalum nitride resistor [ELECTR] A thin-film resistor consisting of tantalum nitride deposited on a substrate, such as industrial sapphire. { 'tant·əl·əm 'nīˌtrīd riˈzis·tər }

tap [DES ENG] **1.** A plug of accurate thread, form, and dimensions on which cutting edges are formed; it is screwed into a hole to cut an internal thread. **2.** A threaded cone-shaped fishing tool. [ELEC] A connection made at some point other than the ends of a resistor or coil. [ENG] A small, threaded hole drilled into a pipe or process vessel; used as connection points for sampling devices, instruments, or controls. { tap }

tap bolt [DES ENG] A bolt with a head that can be screwed into a hole and held in place without a nut. Also known as tap screw. { 'tap ˌbōlt }

tap crystal [ELECTR] Compound semiconductor that stores current when stimulated by light and then gives up energy as flashes of light when it is physically tapped. { 'tap ˌkrist·əl }

tap drill [MECH ENG] A drill used to make a hole of a precise size for tapping. { 'tap ˌdril }

tape [ENG] A graduated steel ribbon used, instead of a chain, in surveying. { tāp }

tape-automated bonding [ELECTR] A semiconductor chip (die) assembly method, where the chips are connected to polyimide (tape) carriers, complete with circuitry for attachment to a printed circuit board. The chip-bonded tape carriers typically are supplied on a reel (like a roll of film) for automated circuit assembly processes. { ˌtāp ˌōd·əˌmād·əd 'bän·diŋ }

tape cartridge [ENG ACOUS] A cartridge that holds a length of magnetic tape in such a way that the cartridge can be slipped into a tape recorder and played without threading the tape; in stereophonic usage, usually refers to an eight-track continuous-loop cartridge, which is larger than a cassette. Also known as cartridge. { 'tāp ˌkär·trij }

tape-controlled machine [MECH ENG] A machine tool whose movements are automatically controlled by means of a magnetic or punched tape. { 'tāp kənˌtrōld məˌshēn }

tape correction [ENG] A quantity applied to a taped distance to eliminate or reduce errors due to the physical condition of the tape and the manner in which it is used. { 'tāp kəˌrek·shən }

tape deck [ENG ACOUS] A tape-recording mechanism that is mounted on a motor board, including the tape transport, electronics, and controls, but no power amplifier or loudspeaker. { 'tāp ˌdek }

tape drive *See* tape transport. [MECH ENG] A device that transmits power from an actuator to a remote mechanism by flexible tapes and pulleys. { 'tāp ˌdrīv }

tape-float liquid-level gage [ENG] A liquid-level measurement by a float connected by a flexible tape to a rotating member, in turn connected to an indicator mechanism. { 'tāp ˌflōt 'lik·wəd ˌlev·əl ˌgāj }

tape gage [ENG] A box- or float-type tide gage which consists essentially of a float attached to a tape and counterpoise; the float operates in a vertical box or pipe which dampens out short-period wind waves while admitting the slower tidal movement; for the standard installation, the tape is graduated with numbers increasing toward the float and is arranged with pulleys and counterpoise to pass up and down over a fixed reading mark as the tide rises and falls. { 'tāp ˌgāj }

tape loop [ENG ACOUS] A length of magnetic tape having the ends spliced together to form an endless loop; used in message repeater units and in some types of tape cartridges to eliminate the need for rewinding the tape. { 'tāp ˌlüp }

tape player [ENG ACOUS] A machine designed only for playback of recorded magnetic tapes. { 'tāp ˌplā·ər }

taper bit [DES ENG] A long, cone-shaped noncoring bit used in drilling blastholes and in wedging and reaming operations. { 'tā·pər ˌbit }

tape recorder [ENG ACOUS] A device that records audio signals and other information on magnetic tape by selective magnetization of iron oxide particles that form a thin film on the tape; a recorder usually also includes provisions for playing back the recorded material. { 'tāp riˌkȯrd·ər }

tape recording [ENG ACOUS] The record made on a magnetic tape by a tape recorder. { 'tāp ri,kȯrd·iŋ }

tapered core bit [DES ENG] A core bit having a conical diamond-inset crown surface tapering from a borehole size at the bit face to the next larger borehole size at its upper, shank, or reaming-shell end. { 'tā·pərd 'kȯr ,bit }

tapered joint [DES ENG] A firm, leakproof connection between two pieces of pipe having the thread formed with a slightly tapering diameter. { 'tā·pərd 'jȯint }

tapered thread [DES ENG] A screw thread cut on the surface of a tapered part; it may be either a pine or box thread, or a V-, Acme, or square-screw thread. { 'tā·pərd 'thred }

tapered wheel [DES ENG] A flat-face grinding wheel with greater thickness at the hub than at the face. { 'tā·pərd 'wēl }

taper gage [ENG] A precision gage that is used to check the accuracy of a standard taper. { 'tā·pər ,gāj }

taper key [DES ENG] A rectangular machine key that is slightly tapered along its length. { 'tā·pər ,kē }

taper pin [DES ENG] A small, tapered self-holding peg or nail used to connect parts together. { 'tā·pər ,pin }

taper pipe thread *See* pipe thread. { 'tā·pər 'pīp ,thred }

taper plug gage [DES ENG] An internal gage in the shape of a frustrum of a cone used to measure internal tapers. { 'tā·pər 'pləg ,gāj }

taper reamer [DES ENG] A reamer whose fluted portion tapers toward the front end. { 'tā·pər ,rē·mər }

taper ring gage [DES ENG] An external gage having a conical internal contour; used to measure external tapers. { 'tā·pər 'riŋ ,gāj }

taper-rolling bearing [MECH ENG] A roller bearing capable of sustaining end thrust by means of tapered rollers and coned races. { 'tā·pər 'rō·liŋ ,ber·iŋ }

taper shank [DES ENG] A cone-shaped part on a tool that fits into a tapered sleeve on a driving member. { 'tā·pər ,shaŋk }

taper tap [DES ENG] A threaded cone-shaped tool for cutting internal screw threads. { 'tā·pər ,tap }

taper washer [DES ENG] A type of washer designed to be used underneath nuts with tapered flanges to enable the bolt assembly to fit properly when tightened. { 'tā·pər ,wäsh·ər }

tape speed [ENG ACOUS] The speed at which magnetic tape moves past the recording head in a tape recorder; standard speeds are $^{15}/_{16}$, $1^{7}/_{8}$, $3^{3}/_{4}$, $7^{1}/_{2}$, 15, and 30 inches per second (2.38125, 4.7625, 9.525, 19.05, 38.1, and 76.2 centimeters per second); faster speeds give improved high-frequency response under given conditions. { 'tāp ,spēd }

tape transport [ENG ACOUS] The mechanism of a tape recorder that holds the tape reels, drives the tape past the heads, and controls various modes of operation. Also known as tape drive. { 'tāp ,tranz,pȯrt }

taping [ENG] The process of measuring distances with a surveyor's tape. { 'tāp·iŋ }

tappet [MECH ENG] A lever or oscillating member moved by a cam and intended to tap or touch another part, such as a push rod or valve system. { 'tap·ət }

tappet rod [MECH ENG] A rod carrying a tappet or tappets, as one for opening or closing the valves in a steam or an internal combustion engine. { 'tap·ət ,räd }

tapping [MECH ENG] Forming an internal screw thread in a hole or other part by means of a tap. { 'tap·iŋ }

tapping screw *See* self-tapping screw. { 'tap·iŋ ,skrü }

tap screw *See* tap bolt. { 'tap ,skrü }

tap wrench [ENG] A tool used to clamp taps during tapping operations. { 'tap ,rench }

tare [MECH] The weight of an empty vehicle or container; subtracted from gross weight to ascertain net weight. { ter }

target [ELECTR] **1.** In an x-ray tube, the anode or anticathode which emits x-rays when bombarded with electrons. **2.** In a television camera tube, the storage surface that is scanned by an electron beam to generate an output signal current corresponding to the charge-density pattern stored there. **3.** In a cathode-ray tuning indicator tube, one of the electrodes that is coated with a material that fluoresces under electron bombardment. [ENG] **1.** The sliding weight on a leveling rod used in surveying to enable the staffman to read the line of collimation. **2.** The point that a borehole or an exploratory work is intended to reach. **3.** In radar and sonar, any object capable of reflecting the transmitted beam. { 'tär·gət }

target acquisition radar [ENG] An antiaircraft artillery radar, normally of lesser range capabilities but of greater inherent accuracy than that of surveillance radar, whose normal function is to acquire aerial targets either by independent search or on direction of the surveillance radar, and to transfer these targets to tracking radars. { 'tär·gət ə,kwə'zish·ən 'rā,där }

target-type flowmeter [ENG] A fluid-flow measurement device with a small circular target suspended centrally in the flow conduit; the target transmits force to a force-balance transmitter by means of a pivoted bar. { 'tär·gət ˌtīp 'flō ,mēd·ər }

tariff [IND ENG] A government-imposed duty on imported or exported goods. { 'tar·əf }

tarring [ENG] The coating of piles for permanent underground work with prepared acid-free tar. { 'tär·iŋ }

task analysis [IND ENG] A process for determining in detail the specific behaviors required of the personnel involved in a human-machine system. { 'task ə,nal·ə·səs }

task element [IND ENG] The smallest logically

definable set of perceptions, decisions, and responses required of a human being in the performance of a task. { 'task ˌel·ə·mənt }

taut-band ammeter [ENG] A modification of the permanent-magnet movable-coil ammeter in which the jeweled bearings and control springs are replaced by a taut metallic band rigidly held at the ends; the coil is firmly attached to the band, and restoring torque is supplied by twisting of the band. { 'tȯt ¦band 'am,ēd·ər }

taut-line cableway [MECH ENG] A cableway whose operation is limited to the distance between two towers, usually 3000 feet (914 meters) apart, has only one carrier, and the traction cable is reeved at the carrier so that loads can be raised and lowered; the towers can be mounted on trucks or crawlers, and the machine shifted across a wide area. { 'tȯt ¦līn 'kā·bəlˌwā }

tawing [ENG] A tanning process in which alum is used as a partial tannage, supplementing or replacing chrome. { 'tȯ·iŋ }

taxi channel [CIV ENG] A defined path, on a water airport, intended for the use of taxiing aircraft. { 'tak·sē ˌchan·əl }

taxiway [CIV ENG] A specially prepared or designated path on an airport for taxiing aircraft. { 'tak·sēˌwā }

T beam [CIV ENG] A metal beam or bar with a T-shaped cross section. { 'tē ˌbēm }

T bolt [DES ENG] A bolt with a T-shaped head, made to fit into a T-shaped slot in a drill swivel head or in the bed of a machine. { 'tē ˌbōlt }

tbsp *See* tablespoonful.

teach [CONT SYS] To program a robot by guiding it through its motions, which are then recorded and stored in its computer. { tēch }

teach box *See* teach pendant. { 'tēch ˌbäks }

teach-by-doing [CONT SYS] A method of programming a robot in which the operator guides the robot through its intended motions by holding it and performing the work. { ¦tēch ·bī 'dü·iŋ }

teach-by-driving [CONT SYS] Programming a robot by using a teach pendant. { ¦tēch ·bī 'drīv·iŋ }

teach gun *See* teach pendant. { 'tēch ˌgən }

teaching interface [CONT SYS] The devices and hardware that are used to instruct robots and other machinery how to operate, and to specify their motions. { 'tēch·iŋ 'in·tərˌfās }

teach mode [CONT SYS] The mode of operation in which a robot is instructed in its motions, usually by guiding it through these motions using a teach pendant. { 'tēch ˌmōd }

teach pendant [CONT SYS] A hand-held device used to instruct a robot, specifying the character and types of motions it is to undertake. Also known as teach box; teach gun. { 'tēch ˌpen·dənt }

tear down [ENG] **1.** To disassemble a drilling rig preparatory to moving it to another drill site. **2.** To disassemble a machine or change the jigs and fixtures. { 'ter 'daůn }

tear-down time [IND ENG] The downtime of a machine following a given work order which usually involves removing parts such as jigs and fixtures and which must be completely finished before setting up for the next order. { 'ter ¦daůn ˌtīm }

tear strength [MECH] The force needed to initiate or to continue tearing a sheet or fabric. { 'ter ˌstreŋkth }

teaspoonful [MECH] A unit of volume used particularly in cookery and pharmacy, equal to $1\frac{1}{3}$ fluid drams, or 1/3 tablespoonful; in the United States this is equal to approximately 4.9289 cubic centimeters, in the United Kingdom to approximately 4.7355 cubic centimeters. Abbreviated tsp; tspn. { 'tēˌspün,fůl }

technical atmosphere [MECH] A unit of pressure in the metric technical system equal to one kilogram-force per square centimeter. Abbreviated at. { 'tek·nə·kəl 'at·məˌsfir }

technical characteristics [ENG] Those characteristics of equipment which pertain primarily to the engineering principles involved in producing equipment possessing desired characteristics, for example, for electronic equipment; technical characteristics include such items as circuitry, and types and arrangement of components. { 'tek·nə·kəl ˌkar·ik·tə'ris·tiks }

technical evaluation [ENG] The study and investigation to determine the technical suitability of material, equipment, or a system. { 'tek·nə·kəl iˌval·yə'wā·shən }

technical information [ENG] Information, including scientific information, which relates to research, development, engineering, testing, evaluation, production, operation, use, and maintenance of equipment. { 'tek·nə·kəl ˌin·fər'mā·shən }

technical inspection [ENG] Inspection of equipment to determine whether it is serviceable for continued use or needs repairs. { 'tek·nə·kəl in'spek·shən }

technical maintenance [ENG] A category of maintenance that includes the replacement of unserviceable major parts, assemblies, or subassemblies, and the precision adjustment, testing, and alignment of internal components. { 'tek·nə·kəl 'mānt·ən·əns }

technical manual [ENG] A publication containing detailed information on technical procedures, including instructions on the operation, handling, maintenance, and repair of equipment. { 'tek·nə·kəl ˌman·yə·wəl }

technical representative [IND ENG] A person who represents one or more manufacturers in an area and who gives technical advice on the application, installation, operation, and maintenance of their products, in addition to selling the products. { 'tek·nə·kəl ¦rep·riˌzent·əd·iv }

technical specifications [ENG] A detailed description of technical requirements stated in terms suitable to form the basis for the actual design, development, and production processes of an item having the qualities specified in the operational characteristics. { 'tek·nə·kəl ˌspes·ə·fə'kā·shənz }

tectonics [CIV ENG] **1.** The science and art of construction with regard to use and design. **2.** Design relating to crustal deformations of the earth. { tek'tän·iks }

tectonometer [ENG] An apparatus, including a microammeter, used on the surface to obtain knowledge of the structure of the underlying rocks. { ˌtek·tə'näm·əd·ər }

tee [ENG] Shaped like the letter T. { tē }

tee joint [ENG] A joint in which members meet at right angles, forming a T. { 'tē ˌjȯint }

telechir [CONT SYS] A handlike remote manipulator. { 'tel·əˌkir }

telechirics [CONT SYS] The use of teleoperators or remote manipulators. { ˌtel·əˈkir·iks }

telegraph buoy [ENG] A buoy used to mark the position of a submarine telegraph cable. { 'tel·əˌgraf ˌbȯi }

telemeteorograph [ENG] Any meteorological instrument, such as a radiosonde, in which the recording instrument is located at some distance from the measuring apparatus; for example, a meteorological telemeter. { ˌtel·əˌmēd·ē'ȯr·əˌgraf }

telemeteorography [ENG] The science of the design, construction, and operation of various types of telemeteorographs. { ˌtel·əˌmēd·ē·əˈräg·rə·fe }

telemeter [ENG] **1.** The complete measuring, transmitting, and receiving apparatus for indicating or recording the value of a quantity at a distance. Also known as telemetering system. **2.** To transmit the value of a measured quantity to a remote point. { 'tel·əˌmēd·ər }

telemetering [ENG] Transmitting the readings of instruments to a remote location by means of wires, radio waves, or other means. Also known as remote metering; telemetry. { ˌtel·əˈmēd·ə·riŋ }

telemetering system *See* telemeter. { ˌtel·əˈmēd·ə·riŋ ˌsis·təm }

telemetering wave buoy [ENG] A buoy assembly that transmits a radio signal that varies in frequency proportional to the vertical acceleration experienced by the buoy, thereby conveying information about the buoy's vertical motion as it rides the waves. { ˌtel·əˈmēd·ə·riŋ 'wāv ˌbȯi }

telemetry *See* telemetering. { tə'lem·ə·trē }

teleoperation [ENG] **1.** The real-time control of remotely located machines that act as the eyes and hands of a person located elsewhere, it has been used in undersea and lunar exploration, mining, and microsurgery. **2.** Operation from a remote location. Also known as remote manipulation. { ˌtel·ēˌäp·əˈrā·shən }

teleoperator *See* remote manipulator. { ˌtel·ēˌäp·əˌrād·ər }

telephone *See* telephone set. { 'tel·əˌfōn }

telephone dial [ENG] A switch operated by a finger wheel, used to make and break a pair of contacts the required number of times for setting up a telephone circuit to the party being called. { 'tel·əˌfōn ˌdīl }

telephone receiver [ENG ACOUS] The portion of a telephone set that converts the audio-frequency current variations of a telephone line into sound waves, by the motion of a diaphragm activated by a magnet whose field is varied by the electrical impulses that come over the telephone wire. { 'tel·əˌfōn riˌsē·vər }

telephone set [ENG ACOUS] An assembly including a telephone transmitter, a telephone receiver, and associated switching and signaling devices. Also known as telephone. { 'tel·əˌfōn ˌset }

telephone transmitter [ENG ACOUS] The microphone used in a telephone set to convert speech into audio-frequency electric signals. { 'tel·əˌfōn tranzˌmid·ər }

telephotometer [ENG] A photometer that measures the received intensity of a distant light source. { ˌtel·ə·fəˈtäm·əd·ər }

telepresence [CONT SYS] The quality of sensory feedback from a teleoperator or telerobot to a human operator such that the operator feels present at the remote site. { ˌtel·əˈprez·əns }

telepsychrometer [ENG] A psychrometer in which the wet- and dry-bulb thermal elements are located at a distance from the indicating elements. { ˌtel·ə·sīˈkräm·əd·ər }

telerecording bathythermometer [ENG] A device which transmits measurements of sea water depth and temperature over a wire to a ship, where a graph of temperature versus depth is recorded. { 'tel·ə·riˌkȯrd·iŋ ˌbath·i·thərˈmäm·əd·ər }

telerobot [CONT SYS] A type of teleoperator that embodies features of a robot and is programmed for communication with a human operator in a high-level language but can revert to direct control in the event of unplanned contingencies. { ˌtel·əˈrōˌbät }

telescope [ENG] Any device that collects radiation, which may be in the form of electromagnetic or particle radiation, from a limited direction in space. { 'tel·əˌskōp }

telescopic alidade [ENG] An alidade used with a plane table, consisting of a telescope mounted on a straightedge ruler, fitted with a level bubble, scale, and vernier to measure angles, and calibrated to measure distances. { ˌtel·əˈskäp·ik 'alˌād }

telescopic derrick [ENG] A drill derrick divided into two or more sections, with the uppermost sections nesting successively into the lower sections. { ˌtel·əˈskäp·ik 'derik }

telescopic tripod [ENG] A drill or surveyor's tripod each leg of which is a series of two or more closely fitted nesting tubes, which can be locked rigidly together in an extended position to form a long leg or nested one within the other for easy transport. { ˌtel·əˈskäp·ik 'trīˌpäd }

telescoping gage [DES ENG] An adjustable internal gage with a telescoping plunger that expands under spring tension in the hole to be measured; it is locked into position to allow measurement after being withdrawn from the hole. { ˌtel·əˈskōp·iŋ 'gāj }

telescoping valve [MECH ENG] A valve, with

sliding, telescoping members, to regulate water flow in a pipe line with minimum disturbance to stream lines. { ¦tel·ə¦skōp·iŋ 'valv }

telethermometer [ENG] A temperature-measuring system in which the heat-sensitive element is located at a distance from the indicating element. { ¦tel·ə·thər'mäm·əd·ər }

telethermoscope [ENG] A temperature telemeter, frequently used in a weather station to indicate the temperature at the instrument shelter located outside. { ¦tel·ə'thər·məˌskōp }

telethesis [ENG] A robotic manipulation aid for the physically disabled that may be located remote from the body. There are two forms, operated by voice command, or operated through a body-powered prosthesis or a joystick. { tə'le·th·ə·səs }

televiewer [ENG] An acoustic camera that provides an ultrasonic image of the borehole wall during borehole logging. { 'tel·əˌvyü·ər }

television film scanner [ENG] A motion picture projector adapted for use with a television camera tube to televise 24-frame-per-second motion picture film at the 30-frame-per-second rate required for television. { 'tel·əˌvizh·ən 'film ˌskan·ər }

television tower [ENG] A tall metal structure used as a television transmitting antenna, or used with another such structure to support a television transmitting antenna wire. { 'tel·əˌvizh·ən ˌtaú·ər }

telford pavement [CIV ENG] A road pavement having a firm foundation of large stones and stone fragments, and a smooth hard-rolled surface of small stones. { 'tel·fərd ˌpāv·mənt }

Tellerette [CHEM ENG] A type of inert packing with the appearance of a circular-wound spiral, used to create a large surface area to increase contact between falling liquid and rising vapor; used in gas-absorption operations. { 'tel·əˌrīt }

telltale [ENG] A marker on the outside of a tank that indicates on an exterior scale the amount of fluid inside the tank. { 'telˌtāl }

telltale float [CIV ENG] A water-level indicator in a reservoir. { 'telˌtāl ¦flōt }

tellurometer [ENG] A microwave instrument used in surveying to measure distance; the time for a radio wave to travel from one observation point to the other and return is measured and converted into distance by phase comparison, much as in radar. { ˌtel·yə'räm·əd·ər }

telpher [MECH ENG] An electric hoist hanging from and driven by a wheeled cab rolling on a single overhead rail or a rope. { 'tel·fər }

Telsmith breaker [MECH ENG] A type of gyratory crusher, often used for primary crushing; consists of a spindle mounted in a long eccentric sleeve which rotates to impart a gyratory motion to the crushing head, but gives a parallel stroke, that is, the axis of the spindle describes a cylinder rather than a cone, as in the suspended spindle gyratory. { 'telˌsmith ˌbrā·kər }

TEMA standard [CHEM ENG] Shell-and-tube heat-exchange standard designed to supplement the American Society of Mechanical Engineers code for unfired pressure vessels. { 'tē·mə ˌstan·dərd }

temper [ENG] **1.** To moisten and mix clay, plaster, or mortar to the proper consistency for use. **2.** *See* anneal. { 'tem·pər }

temperature [THERMO] A property of an object which determines the direction of heat flow when the object is placed in thermal contact with another object: heat flows from a region of higher temperature to one of lower temperature; it is measured either by an empirical temperature scale, based on some convenient property of a material or instrument, or by a scale of absolute temperature, for example, the Kelvin scale. { 'tem·prə·chər }

temperature-actuated pressure relief valve [MECH ENG] A pressure relief valve which operates when subjected to increased external or internal temperature. { 'tem·prə·chər ¦ak·chəˌwād·əd 'presh·ər riˌlēf ˌvalv }

temperature bath [THERMO] A relatively large volume of a homogeneous substance held at constant temperature, so that an object placed in thermal contact with it is maintained at the same temperature. { 'tem·prə·chər ˌbath }

temperature-chlorinity-depth recorder [ENG] An instrument in which an underwater unit suspended from a cable records temperature, chlorinity, and depth sequentially on a single-pen strip recorder, each quantity being recorded for several seconds at a time. { 'tem·prə·chər klȯ'rin·əd·ē 'depth riˌkȯrd·ər }

temperature color scale [THERMO] The relation between an incandescent substance's temperature and the color of the light it emits. { 'tem·prə·chər 'kəl·ər ˌskāl }

temperature-compensated Zener diode [ELECTR] Positive-temperature-coefficient reversed-bias Zener diode (*pn* junction) connected in series with one or more negative-temperature forward-biased diodes within a single package. { 'tem·prə·chər ¦käm·pənˌsād·əd 'zē·nər 'dīˌōd }

temperature compensation [ELECTR] The process of making some characteristic of a circuit or device independent of changes in ambient temperature. { 'tem·prə·chər ˌkäm·pənˌsā·shən }

temperature control [ENG] A control used to maintain the temperature of an oven, furnace, or other enclosed space within desired limits. { 'tem·prə·chər kənˌtrōl }

temperature error [ENG] That instrument error due to nonstandard temperature of the instrument. { 'tem·prə·chər ˌer·ər }

temperature gradient [THERMO] For a given point, a vector whose direction is perpendicular to an isothermal surface at the point, and whose magnitude equals the rate of change of temperature in this direction. { 'tem·prə·chər ˌgrād·ē·ənt }

temperature profile recorder [ENG] A portable instrument for measuring temperature as a function of depth in shallow water, particularly in

lakes, in which a thermistor element transmits data over an electrical cable to a recording drum and depth is measured by the amount of wire paid out. { 'tem·prə·chər ˌprōˌfīl riˌkȯrd·ər }

temperature scale [THERMO] An assignment of numbers to temperatures in a continuous manner, such that the resulting function is single valued; it is either an empirical temperature scale, based on some convenient property of a substance or object, or it measures the absolute temperature. { 'tem·prə·chər ˌskāl }

temperature sensor [ENG] A device designed to respond to temperature stimulation. { 'tem·prə·chər ˌsen·sər }

temperature transducer [ENG] A device in an automatic temperature-control system that converts the temperature into some other quantity such as mechanical movement, pressure, or electric voltage; this signal is processed in a controller, and is applied to an actuator which controls the heat of the system. { 'tem·prə·chər tranz ˌdü·sər }

tempering air [ENG] Low-temperature air added to a heated airstream to regulate the stream temperature. { 'tem·pə·riŋ ˌer }

template [ENG] **1.** A two-dimensional representation of a machine or other equipment used for building layout design. **2.** A guide or a pattern used in manufacturing items. Also spelled templet. { 'tem·plət }

temporal decomposition [CONT SYS] The partitioning of the control or decision-making problem associated with a large-scale control system into subproblems based on the different time scales relevant to the associated action functions. { 'tem·prəl ˌdēˌkäm·pəˈzish·ən }

temporary structures [CIV ENG] Structures used to facilitate the construction of buildings, bridges, tunnels, and other above- and belowground facilities by providing access, support, and protection for the facility as well as assuring the safety of the workers and the public. { ˈtem·pəˌrer·ē 'strək·chərz }

Ten Broecke chart [THERMO] A graphical plot of heat transfer and temperature differences used to calculate the thermal efficiency of a countercurrent cool-fluid-warm-fluid heat-exchange system. { 'ten ˌbrü·kə ˌchärt }

tender [MECH ENG] A vehicle that is attached to a locomotive and carries supplies of fuel and water. { 'ten·dər }

tendon [CIV ENG] A steel bar or wire that is tensioned, anchored to formed concrete, and allowed to regain its initial length to induce compressive stress in the concrete before use. { 'ten·dən }

tenon [ENG] A tonguelike projection from the end of a framing member which is made to fit into a mortise. { 'ten·ən }

tenon saw [ENG] A precision saw that has a metal strip for stiffening along its back. { 'ten·ən ˌsȯ }

tensile bar [ENG] A molded, cast, or machined specimen of specified cross-sectional dimensions used to determine the tensile properties of a material by use of a calibrated pull test. Also known as tensile specimen; test specimen. { 'ten·səl ˌbär }

tensile modulus [MECH] The tangent or secant modulus of elasticity of a material in tension. { 'ten·səl ˌmäj·ə·ləs }

tensile specimen *See* tensile bar. { 'ten·səl ˌspes·ə·mən }

tensile strength [MECH] The maximum stress a material subjected to a stretching load can withstand without tearing. Also known as hot strength. { 'ten·səl ˌstreŋkth }

tensile stress [MECH] Stress developed by a material bearing a tensile load. { 'ten·səl ˌstres }

tensile test [ENG] A test in which a specimen is subjected to increasing longitudinal pulling stress until fracture occurs. { 'ten·səl ˌtest }

tensimeter [ENG] A device for measuring differences in the vapor pressures of two liquids in which the liquids are placed in sealed, evacuated bulbs connected by a differential manometer. { ten'sim·əd·ər }

tensiometry [ENG] A discipline concerned with the measurement of tension or tensile strength. { ˌten·sē'äm·ə·trē }

tension [MECH] **1.** The condition of a string, wire, or rod that is stretched between two points. **2.** The force exerted by the stretched object on a support. [MECH ENG] A device on a textile manufacturing machine or a sewing machine that regulates the tautness and the movement of the thread or the fabric. Also known as tension device. { 'ten·chən }

tension device *See* tension. { 'ten·chən diˌvīs }

tension member [CIV ENG] A structural member subject to tensile stress. { 'ten·chən ˌmem·bər }

tension pulley [MECH ENG] A pulley around which an endless rope passes mounted on a trolley or other movable bearing so that the slack of the rope can be readily taken up by the pull of the weights. { 'ten·chən ˌpůl·ē }

tension rod [DES ENG] A rod held in place by tension devices at the ends, such as a rod for a clothes closet. [ENG] A rod in a truss or other structure that connects opposite parts in order to prevent their spreading. { 'ten·chən ˌräd }

tensometer [ENG] A portable machine that is used to measure the tensile strength and other mechanical properties of materials. { ten'säm·əd·ər }

tenthmeter *See* angstrom. { 'tenthˌmēd·ər }

terahertz technology [ENG] The generation, detection, and application (such as in communications and imaging) of electromagnetic radiation roughly in the frequency range from 0.05 to 20 terahertz, corresponding to wavelengths from 6 millimeters down to 15 micrometers. { ˌter·əˌhərts tek'näl·ə·jē }

teraohmmeter [ENG] An ohmmeter having a teraohm range for measuring extremely high insulation resistance values. { ˌter·ə'ōmˌmēd·ər }

terminal [ELEC] **1.** A screw, soldering lug, or other point to which electric connections can be

made. Also known as electric terminal. **2.** The equipment at the end of a microwave relay system or other communication channel. **3.** One of the electric input or output points of a circuit or component. { 'tər·mən·əl }

terminal area [ELECTR] The enlarged portion of conductor material surrounding a hole for a lead on a printed circuit. Also known as land; pad. { 'tər·mən·əl ¦er·ē·ə }

terminal clearance capacity [ENG] The amount of cargo or personnel that can be moved through and out of a terminal on a daily basis. { 'tər·mən·əl 'klir·ənts kə¸pas·əd·ē }

terminal operations [ENG] The reception, processing, and staging of passengers; the receipt, transit storage, and marshaling of cargo; the loading and unloading of ships or aircraft; and the manifesting and forwarding of cargo and passengers to destination. { 'tər·mən·əl ¸äp·ə'rā·shənz }

terminal pressure [ENG] A pressure drop across a unit when the maximum allowable pressure drop is reached, as for a filter press. { 'tər·mən·əl ¦presh·ər }

terminal throw velocity [ENG] The velocity at which a stream of air exiting a diffuser impinges on an object or surface. { ¦tər·mən·əl 'thrō və¸läs·əd·ē }

terminal unit [MECH ENG] In an air-conditioning system, a unit at the end of a branch duct through which air is transferred or delivered to the conditioned space. { 'tər·mən·əl ¸yü·nət }

terminating [ELEC] Closing of the circuit at either end of a line or transducer by connecting some device thereto; terminating does not imply any special condition such as the elimination of reflection. { 'tər·mə¸nād·iŋ }

termite shield [BUILD] A strip of metal, usually galvanized iron, bent down at the edges and placed between the foundation of a house and a timber floor, around pipes, and other places where termites can pass. { 'tər¸mīt ¸shēld }

terrace [BUILD] **1.** A flat roof. **2.** A colonnaded promenade. **3.** An open platform extending from a building, usually at ground level. { 'ter·əs }

terrain-clearance indicator *See* absolute altimeter. { tə'rān ¦klir·ənts ¸in·də¸kād·ər }

terrain profile recorder *See* airborne profile recorder. { tə'rān ¦prō¸fīl ri¸kȯrd·ər }

terrain sensing [ENG] The gathering and recording of information about terrain surfaces without actual contact with the object or area being investigated; in particular, the use of photography, radar, and infrared sensing in airplanes and artificial satellites. { tə'rān ¸sens·iŋ }

tertiary air [MECH ENG] Combustion air added to primary and secondary air. { 'tər·shē¸er·ē 'er }

tertiary sewage treatment [CIV ENG] A process for purification of wastewater in which nitrates and phosphates, as well as fine particles, are removed; the process follows removal of raw sludge and biological treatment. Also known as advanced sewage treatment. { ¦tər·shē¸er·ē ¦sü·ij ¸trēt·mənt }

test [IND ENG] A procedure in which the performance of a product is measured under various conditions. { test }

testboard [ELEC] Switchboard equipped with testing apparatus, arranged so that connections can be made from it to telephone lines or central-office equipment for testing purposes. { 'test¸bȯrd }

test chamber [ENG] A place, section, or room having special characteristics where a person or object is subjected to experimental procedures, as an altitude chamber. { 'test ¸chām·bər }

test oscillator *See* signal generator. { 'test ¸äs·ə¸lād·ər }

test pile [CIV ENG] A pile equipped with a platform on which a load of sand or pig iron is placed in order to determine the load a pile can support (usually twice the working load) without settling. { 'test ¸pīl }

test pit [CIV ENG] An open excavation used to obtain soil samples in foundation studies. { 'test ¸pit }

test point [ELEC] A terminal or plug-in connector provided in a circuit to facilitate monitoring, calibration, or trouble-shooting. { 'test ¸pȯint }

test specimen *See* tensile bar. { 'test ¸spes·ə·mən }

tetrode junction transistor *See* double-base junction transistor. { 'te¸trōd 'jəŋk·shən tran¸zis·tər }

tetrode transistor [ELECTR] A four-electrode transistor, such as a tetrode point-contact transistor or double-base junction transistor. { 'te ¸trōd tran'zis·tər }

Texas tower [ENG] A radar tower built in the sea offshore, to serve as part of an early-warning radar network. { 'tek·səs 'taù·ər }

text-to-speech synthesizer [ENG ACOUS] A voice response system that provides an automatic means to take a specification of any English text at the input and generate a natural and intelligible acoustic speech signal at the output by using complex sets of rules for predicting the needed phonemic states directly from the input message and dictionary pronunciations. { ¦tekst tə ¦spēch 'sin·thə¸sīz·ər }

th *See* thermie.

thaw house [ENG] A small building that is designed for thawing frozen dynamite and which is capacious enough for a supply of thawed dynamite for a day's work. { 'thȯ ¸haùs }

thawing [ENG] Warming dynamite, to reduce risk of premature explosion. { 'thȯ·iŋ }

theoretical air [ENG] The amount of air that is theoretically required for complete combustion. { ¸thē·ə'red·ə·kəl 'er }

theoretical cutoff frequency [ELEC] Of an electric structure, a frequency at which, disregarding the effects of dissipation, the attenuation constant changes from zero to a positive value or vice versa. { ¸thē·ə'red·ə·kəl 'kəd¸ȯf ¸frē·kwən·sē }

theoretical plate [CHEM ENG] A distillation column plate or tray that produces perfect distillation (that is, produces the same difference in composition as that existing between a liquid mixture and the vapor in equilibrium with it); the packed-column equivalent of a theoretical plate is the HETP, or height (of packing) equivalent to a theoretical plate. { ˌthē·əˈred·ə·kəl ˈplāt }

theoretical relieving capacity [MECH ENG] The capacity of a theoretically perfect nozzle calculated in volumetric or gravimetric units. { ˌthē·əˈred·ə·kəl riˈlēv·iŋ kəˌpas·əd·ē }

Therberg system [IND ENG] A system of categorizing hand movements that is used in the standard motion-and-time analysis technique. { ˈthərˌbərg ˌsis·təm }

therblig *See* elemental motion. { ˈthərˌblig }

therblig chart [IND ENG] An operation chart with the suboperations divided into basic motions, all designated with appropriate symbols. { ˈthərˌblig ˌchärt }

therm [THERMO] A unit of heat energy, equal to 100,000 international table British thermal units, or approximately 1.055×10^8 joules. { thərm }

thermactor *See* air-injection system. { ˈthərˌmak·tər }

thermal [THERMO] Of or concerning heat. { ˈthər·məl }

thermal ammeter *See* hot-wire ammeter. { ˈthər·məl ˈamˌēd·ər }

thermal-arrest calorimeter [ENG] A vacuum device for measurement of heats of fusion; a sample is frozen under vacuum and allowed to melt as the calorimeter warms to room temperature. { ˈthər·məl əˈrest ˌkal·əˈrim·əd·ər }

thermal barrier *See* thermal break. { ˈthər·məl ˈbar·ē·ər }

thermal break [BUILD] A component that is a poor conductor of heat and is placed in an assembly containing highly conducting materials in order to reduce or prevent the flow of heat. Also known as thermal barrier. { ˈthər·məl ˈbrāk }

thermal bulb [ENG] A device for measurement of temperature; the liquid in a bulb expands with increasing temperature, pressuring a spiral Bourdon-type tube element and causing it to deform (unwind) in direct relation to the temperature in the bulb. { ˈthər·məl ˈbəlb }

thermal capacitance [THERMO] The ratio of the entropy added to a body to the resulting rise in temperature. { ˈthər·məl kəˈpas·əd·əns }

thermal capacity *See* heat capacity. { ˈthər·məl kəˈpas·əd·ē }

thermal compressor [MECH ENG] A steam-jet ejector designed to compress steam at pressures above atmospheric. { ˈthər·məl kəmˈpres·ər }

thermal conductance [THERMO] The amount of heat transmitted by a material divided by the difference in temperature of the surfaces of the material. Also known as conductance. { ˈthər·məl kənˈdək·təns }

thermal conductimetry [THERMO] Measurement of thermal conductivities. { ˈthər·məl ˌkänˌdəkˈtim·ə·trē }

thermal conductivity [THERMO] The heat flow across a surface per unit area per unit time, divided by the negative of the rate of change of temperature with distance in a direction perpendicular to the surface. Also known as coefficient of conductivity; heat conductivity. { ˈthər·məl ˌkanˌdəkˈtiv·əd·ē }

thermal conductivity cell *See* katharometer. { ˈthər·məl ˌkänˌdəkˈtiv·əd·ē ˌsel }

thermal conductivity gage [ENG] A pressure measurement device for high-vacuum systems; an electrically heated wire is exposed to the gas under pressure, the thermal conductivity of which changes with changes in the system pressure. { ˈthər·məl ˌkänˌdəkˈtiv·əd·ē ˌgāj }

thermal conductor [THERMO] A substance with a relatively high thermal conductivity. { ˈthər·məl kənˈdək·tər }

thermal convection *See* heat convection. { ˈthər·məl kənˈvek·shən }

thermal converter [ELECTR] A device that converts heat energy directly into electric energy by using the Seebeck effect; it is composed of at least two dissimilar materials, one junction of which is in contact with a heat source and the other junction of which is in contact with a heat sink. Also known as thermocouple converter; thermoelectric generator; thermoelectric power generator; thermoelement. [ENG] An instrument used with external resistors for ac current and voltage measurements over wide ranges, consisting of a conductor heated by an electric current, with one or more hot junctions of a thermocouple attached to it, so that the output emf responds to the temperature rise, and hence the current. { ˈthər·məl kənˈvərd·ər }

thermal coulomb [THERMO] A unit of entropy equal to 1 joule per kelvin. { ˈthər·məl ˈkülˌläm }

thermal cracking [CHEM ENG] A petroleum refining process that decomposes, rearranges, or combines hydrocarbon molecules by the application of heat, without the aid of catalysts. { ˈthər·məl ˈkrak·iŋ }

thermal detector *See* bolometer. { ˈthər·məl di ˈtek·tər }

thermal diffusivity *See* diffusivity. { ˈthər·məl ˌdi·fyü·siv·əd·ē }

thermal drift [ELECTR] Drift caused by internal heating of equipment during normal operation or by changes in external ambient temperature. { ˈthər·məl ˈdrift }

thermal drilling [MECH ENG] A machining method in which holes are drilled in a workpiece by heat generated from the friction of a rotating tool. { ˈthər·məl ˈdril·iŋ }

thermal efficiency [CHEM ENG] In a tube-and-shell heat-exchange system, the ratio of the actual temperature range of the tube-side fluid (inlet versus outlet temperature) to the maximum possible temperature range. *See* efficiency. { ˈthər·məl iˈfish·ən·sē }

thermal effusion *See* thermal transpiration. { 'thər·məl e'fyü·zhən }

thermal emissivity *See* emissivity. { 'thər·məl ˌē·mi'siv·əd·ē }

thermal environment [IND ENG] Those aspects of the workplace that include local temperature, humidity, and air velocity as well as the presence of radiating surfaces. { 'thərm·əl in'vī·rən·mənt }

thermal equilibrium [THERMO] Property of a system all parts of which have attained a uniform temperature which is the same as that of the system's surroundings. { 'thər·məl ˌē·kwə'lib·rē·əm }

thermal farad [THERMO] A unit of thermal capacitance equal to the thermal capacitance of a body for which an increase in entropy of 1 joule per kelvin results in a temperature rise of 1 kelvin. { 'thər·məl 'farˌad }

thermal flame safeguard [MECH ENG] A thermocouple located in the pilot flame of a burner; if the pilot flame is extinguished, an elective circuit is interrupted and the fuel supply is shut off. { 'thər·məl 'flām ˌsāfˌgärd }

thermal flux *See* heat flux. { 'thər·məl 'fləks }

thermal henry [THERMO] A unit of thermal inductance equal to the product of a temperature difference of 1 kelvin and a time of 1 second divided by a rate of flow of entropy of 1 watt per kelvin. { 'thər·məl 'hen·rē }

thermal hysteresis [THERMO] A phenomenon sometimes observed in the behavior of a temperature-dependent property of a body; it is said to occur if the behavior of such a property is different when the body is heated through a given temperature range from when it is cooled through the same temperature range. { 'thər·məl ˌhis·tə'rē·səs }

thermal inductance [THERMO] The product of temperature difference and time divided by entropy flow. { 'thər·məl in'dək·təns }

thermal instrument [ENG] An instrument that depends on the heating effect of an electric current, such as a thermocouple or hot-wire instrument. { 'thər·məl 'in·strə·mənt }

thermal-liquid system [CHEM ENG] A system with a special liquid that acts as a heat sink or heat source (for example, steam, hot water, mercury, Dowtherm, molten salts, or mineral oils); used for process heating and cooling. { 'thər·məl ˌlik·wəd ˌsis·təm }

thermal-loss meter *See* heat-loss flowmeter. { 'thər·məl ˌlós ˌmēd·ər }

thermal mapper *See* line scanner. { 'thər·məl 'map·ər }

thermal microphone [ENG ACOUS] Microphone depending for its action on the variation in the resistance of an electrically heated conductor that is being alternately increased and decreased in temperature by sound waves. { 'thər·məl 'mī·krəˌfōn }

thermal neutron analysis [ENG] A technique for detecting explosives, in which the object under inspection is conveyed through a cloud of thermal neutrons (generated by slowing down fast neutrons in multiple collisions in a moderator surrounding the source), and the characteristic high-energy gamma rays that are then emitted by the objects are used in analysis and imaging. { ˌthər·məl 'nüˌträn əˌnal·ə·səs }

thermal ohm [THERMO] A unit of thermal resistance equal to the thermal resistance for which a temperature difference of 1 kelvin produces a flow of entropy of 1 watt per kelvin. Also known as fourier. { 'thər·məl 'ōm }

thermal polymerization [CHEM ENG] A thermal, petroleum refining process used to convert light hydrocarbon gases into liquid fuels; paraffinic hydrocarbons are cracked to produce olefinic material which is concurrently polymerized by heat and pressure to form liquids, the product being known as polymer gasoline. { 'thər·məl pəˌlim·ə·rə'zā·shən }

thermal potential difference [THERMO] The difference between the thermodynamic temperatures of two points. { 'thər·məl pə'ten·chəl 'dif·rəns }

thermal power plant [ENG] A facility to produce electric energy from thermal energy released by combustion of a fuel or consumption of a fissionable material. { 'thər·məl 'paü·ər ˌplant }

thermal probe [ENG] An instrument which measures the heat flow from ocean bottom sediment. [MECH ENG] A calorimeter in a boiler furnace which measures heat absorption rates. { 'thər·məl 'prōb }

thermal process [CHEM ENG] Any process that utilizes heat, without the aid of a catalyst, to accomplish chemical change; for example, thermal cracking, thermal reforming, or thermal polymerization. { 'thər·məl 'prä·səs }

thermal radiation *See* heat radiation. { 'thər·məl ˌrād·ē'ā·shən }

thermal reactor [CHEM ENG] A device, system, or vessel in which chemical reactions take place because of heat (no catalysis); for example, thermal cracking, thermal reforming, or thermal polymerization. { 'thər·məl rē'ak·tər }

thermal reforming [CHEM ENG] A petroleum refining process using heat (but no catalyst) to effect molecular rearrangement of a low-octane naphtha to form high-octane motor gasoline. { 'thər·məl ri'fȯrm·iŋ }

thermal relief [ENG] A valve or other device that is preset to open when pressure becomes excessive due to increased temperature of the system. { 'thər·məl ri'lēf }

thermal resistance [ELECTR] *See* effective thermal resistance. [THERMO] A measure of a body's ability to prevent heat from flowing through it, equal to the difference between the temperatures of opposite faces of the body divided by the rate of heat flow. Also known as heat resistance. { 'thər·məl ri'zis·təns }

thermal resistivity [THERMO] The reciprocal of the thermal conductivity. { 'thər·məl rēˌzis'tiv·əd·ē }

thermal shock [MECH] Stress produced in a body or in a material as a result of undergoing

a sudden change in temperature. { 'thər·məl 'shäk }

thermal soakback [ENG] A phenomenon whereby, due to the lag in propagation of temperature changes through insulating materials, the maximum temperature of a thermally protected structure may be reached a certain time after the protective coating has reached its maximum temperature. { ˌthər·məl 'sōkˌbak }

thermal stress [MECH] Mechanical stress induced in a body when some or all of its parts are not free to expand or contract in response to changes in temperature. { 'thər·məl 'stres }

thermal stress cracking [MECH] Crazing or cracking of materials (plastics or metals) by overexposure to elevated temperatures and sudden temperature changes or large temperature differentials. { 'thər·məl ˈstres ˈkrak·iŋ }

thermal telephone receiver [ENG ACOUS] A thermophone used as a telephone receiver. { 'thər·məl 'tel·əˌfōn riˌsē·vər }

thermal transducer [ENG] Any device which converts energy from some form other than heat energy into heat energy; an example is the absorbing film used in the thermal pulse method. { 'thər·məl tranz'dü·sər }

thermal transpiration [THERMO] The formation of a pressure gradient in gas inside a tube when there is a temperature gradient in the gas and when the mean free path of molecules in the gas is a significant fraction of the tube diameter. Also known as thermal effusion. { 'thər·məl ˌtranz·pə'rā·shən }

thermal value [THERMO] Heat produced by combustion, usually expressed in calories per gram or British thermal units per pound. { 'thər·məl ˌval·yü }

thermal valve [MECH ENG] A valve controlled by an element made of material that exhibits a significant change in properties in response to a change in temperature. { 'thər·məl 'valv }

thermal volt *See* kelvin. { 'thər·məl 'vōlt }

thermal wattmeter [ENG] A wattmeter in which thermocouples are used to measure the heating produced when a current is passed through a resistance. { 'thər·məl 'wätˌmēd·ər }

thermic boring [ENG] Boring holes into concrete by means of a high temperature, produced by a steel lance packed with steel wool which is ignited and kept burning by oxyacetylene or other gas. { 'thər·mik 'bȯr·iŋ }

thermie [THERMO] A unit of heat energy equal to the heat energy needed to raise 1 tonne of water from 14.5°C to 15.5°C at a constant pressure of 1 standard atmosphere; equal to 10^6 fifteen-degrees calories or $(4.1855 \pm 0.0005) \times 10^6$ joules. Abbreviated th. { 'thər·mē }

thermion [ELECTR] A charged particle, either negative or positive, emitted by a heated body, as by the hot cathode of a thermionic tube. { ˈthərmˈīˌän }

thermionic [ELECTR] Pertaining to the emission of electrons as a result of heat. { ˌthər·mē'än·ik }

thermionic emission [ELECTR] **1.** The outflow of electrons into vacuum from a heated electric conductor. Also known as Edison effect; Richardson effect. **2.** More broadly, the liberation of electrons or ions from a substance as a result of heat. { ˌthər·mē'än·ik i'mish·ən }

thermistor [ELECTR] A resistive circuit component, having a high negative temperature coefficient of resistance, so that its resistance decreases as the temperature increases; it is a stable, compact, and rugged two-terminal ceramiclike semiconductor bead, rod, or disk. Derived from thermal resistor. { thər'mis·tər }

thermoacoustic engine [ENG] A heat engine that harnesses the combination of the pressure oscillations of a sound wave with the accompanying adiabatic temperature oscillations. { ˌthər·mō·əˌkü·stik 'en·jən }

thermoacoustic refrigerator [ENG] A device that uses acoustic power to pump heat from a region of low temperature to a region of ambient temperature. { ˌthər·mō·əˌkü·stik riˈfrij·əˌrād·ər }

thermoacoustic-Stirling engine [ENG] A device in which the thermodynamic cycle of a Stirling engine is accomplished in a traveling-wave acoustic network, and acoustic power is produced from heat. { ˌthər·mō·əˌkü·stikˌstər·liŋ 'en·jən }

thermoammeter [ENG] An ammeter that is actuated by the voltage generated in a thermocouple through which is sent the current to be measured; used chiefly for measuring radio-frequency currents. Also known as electrothermal ammeter; thermocouple ammeter. { ˌthər·mō'am ˌēd·ər }

thermochemical calorie *See* calorie. { ˌthər·mō 'kem·ə·kəl 'kal·ə·rē }

thermocompression bonding [ENG] Use of a combination of heat and pressure to make connections, as when attaching beads to integrated-circuit chips; examples include wedge bonding and ball bonding. { ˌthər·mō·kəm'presh·ən 'bänd·iŋ }

thermocompression evaporator [MECH ENG] A system to reduce the energy requirements for evaporation by compressing the vapor from a single-effect evaporator so that the vapor can be used as the heating medium in the same evaporator. { ˌthər·mō·kəm'presh·ən i'vap·əˌrād·ər }

thermocouple [ENG] A device consisting basically of two dissimilar conductors joined together at their ends; the thermoelectric voltage developed between the two junctions is proportional to the temperature difference between the junctions, so the device can be used to measure the temperature of one of the junctions when the other is held at a fixed, known temperature, or to convert radiant energy into electric energy. { 'thər·məˌkəp·əl }

thermocouple ammeter *See* thermoammeter. { 'thər·məˌkəp·əl 'amˌēd·ər }

thermocouple pyrometer *See* thermoelectric pyrometer. { 'thər·məˌkəp·əl pī'räm·əd·ər }

thermocouple vacuum gage [ENG] A vacuum

gage that depends for its operation on the thermal conduction of the gas present; pressure is measured as a function of the voltage of a thermocouple whose measuring junction is in thermal contact with a heater that carries a constant current; ordinarily, used over a pressure range of 10^{-1} to 10^{-3} millimeter of mercury. { 'thər·mə,kap·əl 'vak·yəm ˌgāj }

thermodynamic cycle [THERMO] A procedure or arrangement in which some material goes through a cyclic process and one form of energy, such as heat at an elevated temperature from combustion of a fuel, is in part converted to another form, such as mechanical energy of a shaft, the remainder being rejected to a lower temperature sink. Also known as heat cycle. { ˌthər·mō·dī'nam·ik 'sī·kəl }

thermodynamic efficiency [IND ENG] An index for rating the effort required by a worker performing a task in terms of the ratio of work performed to the energy consumed. { ˌthər·mō·dī'nam·ik i'fish·ən·sē }

thermodynamic equation of state [THERMO] An equation that relates the reversible change in energy of a thermodynamic system to the pressure, volume, and temperature. { ˌthər·mō·dī'nam·ik i'kwā·zhən əv 'stāt }

thermodynamic equilibrium [THERMO] Property of a system which is in mechanical, chemical, and thermal equilibrium. { ˌthər·mō·dī'nam·ik ˌē·kwə'lib·rē·əm }

thermodynamic function of state [THERMO] Any of the quantities defining the thermodynamic state of a substance in thermodynamic equilibrium; for a perfect gas, the pressure, temperature, and density are the fundamental thermodynamic variables, any two of which are, by the equation of state, sufficient to specify the state. Also known as state parameter; state variable; thermodynamic variable. { ˌthər·mō·dī'nam·ik 'faŋk·shən əv 'stāt }

thermodynamic potential [THERMO] One of several extensive quantities which are determined by the instantaneous state of a thermodynamic system, independent of its previous history, and which are at a minimum when the system is in thermodynamic equilibrium under specified conditions. { ˌthər·mō·dī'nam·ik pə 'ten·chəl }

thermodynamic potential at constant volume *See* free energy. { ˌthər·mō·dī'nam·ik pəˌten·chəl at 'kän·stənt 'väl·yəm }

thermodynamic principles [THERMO] Laws governing the conversion of energy from one form to another. { ˌthər·mō·dī'nam·ik 'prin·sə·pəlz }

thermodynamic probability [THERMO] Under specified conditions, the number of equally likely states in which a substance may exist; the thermodynamic probability Ω is related to the entropy S by $S = k \ln \Omega$, where k is Boltzmann's constant. { ˌthər·mō·dī'nam·ik ˌprāb·ə'bil·əd·ē }

thermodynamic process [THERMO] A change of any property of an aggregation of matter and energy, accompanied by thermal effects. { ˌthər·mō·dī'nam·ik 'prä·səs }

thermodynamic property [THERMO] A quantity which is either an attribute of an entire system or is a function of position which is continuous and does not vary rapidly over microscopic distances, except possibly for abrupt changes at boundaries between phases of the system; examples are temperature, pressure, volume, concentration, surface tension, and viscosity. Also known as macroscopic property. { ˌthər·mō·dı 'nam·ik 'präp·ərd·ē }

thermodynamic system [THERMO] A part of the physical world as described by its thermodynamic properties. { ˌthər·mō·dī'nam·ik 'sis·təm }

thermodynamic temperature scale [THERMO] Any temperature scale in which the ratio of the temperatures of two reservoirs is equal to the ratio of the amount of heat absorbed from one of them by a heat engine operating in a Carnot cycle to the amount of heat rejected by this engine to the other reservoir; the Kelvin scale and the Rankine scale are examples of this type. { ˌthər·mō·dī'nam·ik 'tem·prə·chər ˌskāl }

thermodynamic variable *See* thermodynamic function of state. { ˌthər·mō·dī'nam·ik 'ver·ē·ə·bəl }

thermoelectric converter [ELECTR] A converter that changes solar or other heat energy to electric energy; used as a power source on spacecraft. { ˌthər·mō·i'lek·trik kən'vərd·ər }

thermoelectric cooler [ENG] An electronic heat pump based on the Peltier effect, involving the absorption of heat when current is sent through a junction of two dissimilar metals; it can be mounted within the housing of a device to prevent overheating or to maintain a constant temperature. { ˌthər·mō·i'lek·trik 'kü·lər }

thermoelectric cooling [ENG] Cooling of a chamber based on the Peltier effect; an electric current is sent through a thermocouple whose cold junction is thermally coupled to the cooled chamber, while the hot junction dissipates heat to the surroundings. Also known as thermoelectric refrigeration. { ˌthər·mō·i'lek·trik 'kül·iŋ }

thermoelectric generator *See* thermal converter. { ˌthər·mō·i'lek·trik 'jen·əˌrād·ər }

thermoelectric heating [ENG] Heating based on the Peltier effect, involving a device which is in principle the same as that used in thermoelectric cooling except that the current is reversed. { ˌthər·mō·i'lek·trik 'hēd·iŋ }

thermoelectric junction *See* thermojunction. { ˌthər·mō·i'lek·trik 'jəŋk·shən }

thermoelectric laws [ENG] Basic relationships used in the design and application of thermocouples for temperature measurement; for example, the law of the homogeneous circuit, the law of intermediate metals, and the law of successive or intermediate temperatures. { ˌthər·mō·i'lek·trik 'lȯz }

thermoelectric material [ELECTR] A material that can be used to convert thermal energy into electric energy or provide refrigeration directly

from electric energy; good thermoelectric materials include lead telluride, germanium telluride, bismuth telluride, and cesium sulfide. { ¦thər·mō·i'lek·trik mə'tir·ē·əl }

thermoelectric pyrometer [ENG] An instrument which uses one or more thermocouples to measure high temperatures, usually in the range between 800 and 2400°F (425 and 1315°C). Also known as thermocouple pyrometer. { ¦thər·mō·i'lek·trik pī'räm·əd·ər }

thermoelectric refrigeration *See* thermoelectric cooling. { ¦thər·mō·i'lek·trik ri¸frij·ə'rā·shən }

thermoelectric thermometer [ENG] A type of electrical thermometer consisting of two thermocouples which are series-connected with a potentiometer and a constant-temperature bath; one couple, called the reference junction, is placed in a constant-temperature bath, while the other is used as the measuring junction. { ¦thər·mō·i'lek·trik thər'mäm·əd·ər }

thermoelectromotive force [ELEC] Voltage developed due to differences in temperature between parts of a circuit containing two or more different metals. { ¦thər·mō·i¦lek·trə¦mōd·iv 'fȯrs }

thermoforming [ENG] Forming of thermoplastic sheet by heating it and then pulling it down onto a mold surface to shape it. { 'thər·mə¸fȯrm·iŋ }

thermogalvanometer [ENG] Instrument for measuring small high-frequency currents by their heating effect, generally consisting of a direct-current galvanometer connected to a thermocouple that is heated by a filament carrying the current to be measured. { ¦thər·mō·gal·və'näm·əd·ər }

thermograd probe [ENG] An instrument that makes a record of temperature versus depth as it is lowered to the ocean floor, and measures heat flow through the ocean floor. { 'thər·mə¸grad 'prōb }

thermogram [ENG] The recording made by a thermograph. { 'thər·mə¸gram }

thermograph [ENG] An instrument that senses, measures, and records the temperature of the atmosphere. Also known as recording thermometer. { 'thər·mə¸graf }

thermograph correction card [ENG] A table for quick and accurate correction of the reading of a thermograph to that of the more accurate dry-bulb thermometer at the same time and place. { 'thər·mə¸graf kə'rek·shən ¸kärd }

thermography [ENG] A method of measuring surface temperature by using luminescent materials: the two main types are contact thermography and projection thermography. { thər'mäg·rə·fē }

thermogravitational column [CHEM ENG] A device in which thermal diffusion results from the countercurrent flow of hot and cold material, thus increasing the separation of materials in a solution by the formation of a concentration gradient (difference). Also known as Clausius-Dickel column. { ¦thər·mō¸grav·ə'tā·shən·əl 'käl·əm }

thermointegrator [ENG] An apparatus, used in studying soil temperatures, for measuring the total supply of heat during a given period; it consists of a long nickel coil (inserted into the soil by an attached rod) forming a 100-ohm resistance thermometer and a 6-volt battery, the current used being recorded on a galvanometer; a mercury thermometer can be used. { ¦thər·mō'int·ə¸grād·ər }

thermojunction [ELECTR] One of the surfaces of contact between the two conductors of a thermocouple. Also known as thermoelectric junction. { ¦thər·mō'jəŋk·shən }

thermometer [ENG] An instrument that measures temperature. { thər'mäm·əd·ər }

thermometer anemometer [ENG] An anemometer consisting of two thermometers, one with an electric heating element connected to the bulb; the heated bulb cools in an airstream, and the difference in temperature as registered by the heated and unheated thermometers can be translated into air velocity by a conversion chart. { thər'mäm·əd·ər ¸an·ə'mäm·əd·ər }

thermometer-bulb liquid-level meter [ENG] Detection of liquid level by temperature measurement changes using an immersed bulb-type thermometer. { thər'mäm·əd·ər ¦bəlb 'lik·wəd ¦lev·əl ¸mēd·ər }

thermometer frame [ENG] A frame designed to hold two or more reversing thermometers; such a frame is often attached directly to a Nansen bottle. { thər'mäm·əd·ər ¸frām }

thermometer screen *See* instrument shelter. { thər'mäm·əd·ər ¸skrēn }

thermometer shelter *See* instrument shelter. { thər'mäm·əd·ər ¸shel·tər }

thermometer support [ENG] A device used to hold liquid-in-glass maximum and minimum thermometers in the proper recording position inside an instrument shelter, and to permit them to be read and reset. { thər'mäm·əd·ər sə¸pȯrt }

thermometric conductivity *See* diffusivity. { ¦thər·mə¦me·trik ¸kän¸dək¸tiv·əd·ē }

thermometric fluid [THERMO] A fluid that has properties, such as a large and uniform thermal expansion coefficient, good thermal conductivity, and chemical stability, that make it suitable for use in a thermometer. { ¸thər·mə¦me·trik 'flü·əd }

thermometric property [THERMO] A physical property that changes in a known way with temperature, and can therefore be used to measure temperature. { ¦thər·mə¦me·trik 'präp·ərd·ē }

thermometry [THERMO] The science and technology of measuring temperature, and the establishment of standards of temperature measurement. { thər'mäm·ə·trē }

thermomigration [ELECTR] A technique for doping semiconductors in which exact amounts of known impurities are made to migrate from the cool side of a wafer of pure semiconductor material to the hotter side when the wafer is heated in an oven. { ¦thər·mō·mī'grā·shən }

thermo-pervaporation *See* membrane distillation. { ¦thər·mō·pər¸vap·ə'rā·shən }

thermophone [ENG ACOUS] An electroacoustic transducer in which sound waves having an accurately known strength are produced by the expansion and contraction of the air adjacent to a strip of conducting material, whose temperature varies in response to a current input that is the sum of a steady current and a sinusoidal current; used chiefly for calibrating microphones. { 'thər·mə,fōn }

thermophoresis [THERMO] The movement of particles in a thermal gradient from high to low temperatures. { ,thər·mə·fə'rē·səs }

thermopile [ENG] An array of thermocouples connected either in series to give higher voltage output or in parallel to give higher current output, used for measuring temperature or radiant energy or for converting radiant energy into electric power. { 'thər·mə,pīl }

thermoregulator [ENG] A high-accuracy or high-sensitivity thermostat; one type consists of a mercury-in-glass thermometer with sealed-in electrodes, in which the rising and falling column of mercury makes and breaks an electric circuit. { ¦thər·mō'reg·yə,lād·ər }

thermorelay *See* thermostat. { ¦thər·mō'rē,lā }

thermoscreen *See* instrument shelter. { 'thər·mə,skrēn }

thermosiphon [MECH ENG] A closed system of tubes connected to a water-cooled engine which permit natural circulation and cooling of the liquid by utilizing the difference in density of the hot and cool portions. { ¦thər·mō'sī·fən }

thermosiphon reboiler [CHEM ENG] A liquid reheater (as for distillation-column bottoms) in which natural circulation of the boiling liquid is obtained by maintaining a sufficient liquid head. { ¦thər·mō'sī·fən ¦rē'bói·lər }

thermostat [ENG] An instrument which measures changes in temperature and directly or indirectly controls sources of heating and cooling to maintain a desired temperature. Also known as thermorelay. { 'thər·mə,stat }

thermostatic switch [ELEC] A temperature-operated switch that receives its operating energy by thermal conduction or convection from the device being controlled or operated. { ¦thər·mə¦stad·ik 'swich }

thermoswitch *See* thermal switch. { 'thər·mə ,swich }

thermovoltmeter [ENG] A voltmeter in which a current from the voltage source is passed through a resistor and a fine vacuum-enclosed platinum heater wire; a thermocouple, attached to the midpoint of the heater, generates a voltage of a few millivolts, and this voltage is measured by a direct-current millivoltmeter. { ¦thər·mō 'vōlt,mēd·ər }

thetagram [THERMO] A thermodynamic diagram with coordinates of pressure and temperature, both on a linear scale. { 'thād·ə,gram }

thickener [ENG] A nonfilter device for the removal of liquid from a liquid-solids slurry to give a dewatered (thickened) solids product; can be by gravity settling or centrifugation. { 'thik·ə·nər }

thickening [CHEM ENG] The concentration of the solids in a suspension in order to recover a fraction with a higher concentration of solids than in the original suspension. { 'thik·ə·niŋ }

thick-film capacitor [ELEC] A capacitor in a thick-film circuit, made by successive screen-printing and firing processes. { 'thik ¦film kə 'pas·əd·ər }

thick-film circuit [ELECTR] A microcircuit in which passive components, of a ceramic-metal composition, are formed on a ceramic substrate by successive screen-printing and firing processes, and discrete active elements are attached separately. { 'thik ¦film 'sər'kət }

thick-film hybrid [ELECTR] An assembly consisting of a thick-film circuit pattern with mounting positions for the insertion of conventional silicon devices. { ¸thik ¸film 'hī·brəd }

thick-film resistor [ELEC] Fixed resistor whose resistance element is a film well over 0.001 inch (25 micrometers) thick. { 'thik ¦film ri'zis·tər }

thick-film sensor [ENG] A thick-film circuit that is fabricated from suitable materials to measure a physical quantity such as mechanical stress or temperature or to perform a chemical sensing application such as the measurement of gas or liquid composition, acidity, or humidity. { ¸thik ¸film 'sen·sər }

thickness gage [ENG] A gage for measuring the thickness of a sheet of material, the thickness of an object, or the thickness of a coating; examples include penetration-type and backscattering radioactive thickness gages and ultrasonic thickness gages. { 'thik·nəs ¸gāj }

Thiele coordinates [CHEM ENG] A graphical method for calculating the solvent-free composition of two components being separated by solvent extraction. { 'tēl·ə kō¸ord·ən·əts }

Thiele-Geddes method [CHEM ENG] A method for the prediction of the product distribution from a multicomponent distillation system. { 'tēl·ə 'ged·əs ¸meth·əd }

thin film [ELECTR] A film a few molecules thick deposited on a glass, ceramic, or semiconductor substrate to form a capacitor, resistor, coil, cryotron, or other circuit component. { 'thin 'film }

thin-film capacitor [ELEC] A capacitor that can be constructed by evaporation of conductor and dielectric films in sequence on a substrate; silicon monoxide is generally used as the dielectric. { 'thin ¦film kə'pas·əd·ər }

thin-film circuit [ELECTR] A circuit in which the passive components and conductors are produced as films on a substrate by evaporation or sputtering; active components may be similarly produced or mounted separately. { 'thin ¦film 'sər·kət }

thin-film field-emitter cathode [ELECTR] A sharply pointed microminiature electron field emitter with an integral low-voltage extraction gate. { ¦thin ¸film ¦fēld i¸mid·ər 'kath¸ōd }

thin-film integrated circuit [ELECTR] An integrated circuit consisting entirely of thin films deposited in a patterned relationship on a substrate. { 'thin ¦film 'int·ə¸grād·əd 'sər·kət }

thin-film material [ELECTR] A material that can be deposited as a thin film in a desired pattern by a variety of chemical, mechanical, or high-vacuum evaporation techniques. { 'thin ¦film mə'tir·ē·əl }

thin-film resistor [ELEC] A fixed resistor whose resistance element is a metal, alloy, carbon, or other film having a thickness of about 0.000001 inch (25 nanometers). { 'thin ¦film ri'zis·tər }

thin-film semiconductor [ELECTR] Semiconductor produced by the deposition of an appropriate single-crystal layer on a suitable insulator. { 'thin ¦film 'sem·i·kən,dək·tər }

thin-film transistor [ELECTR] A field-effect transistor constructed entirely by thin-film techniques, for use in thin-film circuits. Abbreviated TFT. { 'thin ¦film tran'zis·tər }

thin-plate orifice [ENG] A thin-metal orifice sheet used in fluid-flow measurement in fluid conduits by means of differential pressure drop across the orifice. { 'thin ¦plāt 'ȯr·ə·fəs }

third law of motion *See* Newton's third law. { 'thərd 'lȯ əv 'mō·shən }

third law of thermodynamics [THERMO] The entropy of all perfect crystalline solids is zero at absolute zero temperature. { 'thərd 'lȯ əv ¦thər·mō·də'nam·iks }

third rail [CIV ENG] The electrified metal rail which carries current to the motor of an electric locomotive or other railway car. { 'thərd 'rāl }

13.0 temperature *See* annealing point. { ¦thər,tēn 'tem·prə·chər }

Thoma cavitation coefficient [MECH ENG] The equation for measuring cavitation in a hydraulic turbine installation, relating vapor pressure, barometric pressure, runner setting, tail water, and head. { 'tō·mə ,kav·ə'tā·shən ,kō·i,fish·ənt }

Thomas meter [ENG] An instrument used to determine the rate of flow of a gas by measuring the rise in the gas temperature produced by a known amount of heat. { 'täm·əs ,mēd·ər }

Thomson bridge *See* Kelvin bridge. { 'täm·sən ,brij }

thoroughfare [CIV ENG] **1.** An important, unobstructed public street or highway. **2.** A street going through from one street to another. **3.** An inland waterway for passage of ships usually not between two bodies of water. { 'thər·ə,fer }

thou *See* mil.

thread [DES ENG] A continuous helical rib, as on a screw or pipe. { thred }

thread contour [DES ENG] The shape of thread design as observed in a cross section along the major axis, for example, square or round. { 'thred ,kän,tůr }

thread cutter [MECH ENG] A tool used to cut screw threads on a pipe, screw, or bolt. { 'thred ,kəd·ər }

thread gage [DES ENG] A design gage used to measure screw threads. { 'thred ,gāj }

threading die [MECH ENG] A die which may be solid, adjustable, or spring adjustable, or a self-opening die head, used to produce an external thread on a part. { 'thred·iŋ ,dī }

threading machine [MECH ENG] A tool used to cut or form threads inside or outside a cylinder or cone. { 'thred·iŋ mə,shēn }

thread plug [ENG] Mold part which shapes an internal thread onto a molded article; must be unscrewed from the finished piece. { 'thred ,pləg }

thread plug gage [DES ENG] A thread gage used to measure female screw threads. { 'thred ,pləg ,gāj }

thread protector [ENG] A short-threaded ring to screw onto a pipe or into a coupling to protect the threads while the pipe is being handled or transported. Also known as pipe-thread protector. { 'thred prə,tek·tər }

thread rating [ENG] The maximum internal working pressure allowable for threaded pipe or tubing joints; important for pressure systems, chemical processes, and oil-well systems. { 'thred ,rād·iŋ }

thread ring gage [DES ENG] A thread gage used to measure male screw threads. { 'thred 'riŋ ,gāj }

three-body problem [MECH] The problem of predicting the motions of three objects obeying Newton's laws of motion and attracting each other according to Newton's law of gravitation. { 'thrē ¦bäd·ē ,präb·ləm }

three-dimensional braiding *See* through-the-thickness braiding. { ¦thrē di¦men·chən·əl 'brād·iŋ }

three-dimensional sound *See* virtual acoustics. { ¦thrē də,men·shən·əl 'saůnd }

three-input adder *See* full adder. { 'thrē ¦in,půt 'ad·ər }

three-input subtracter *See* full subtracter. { 'thrē ¦in,půt səb'trak·tər }

three-jaw chuck [DES ENG] A drill chuck having three serrated-face movable jaws that can grip and hold fast an inserted drill rod. { 'thrē ¦jȯ 'chək }

three-junction transistor [ELECTR] A *pnpn* transistor having three junctions and four regions of alternating conductivity; the emitter connection may be made to the *p* region at the left, the base connection to the adjacent *n* region, and the collector connection to the *n* region at the right, while the remaining *p* region is allowed to float. { 'thrē ¦jəŋk·shən tran'zis·tər }

three-layer diode [ELECTR] A junction diode with three conductivity regions. { 'thrē ¦lā·ər 'dī,ōd }

three-phase circuit [ELEC] A circuit energized by alternating-current voltages that differ in phase by one-third of a cycle or 120°. { 'thrē ¦fāz 'sər·kət }

three-point problem [ENG] The problem of locating the horizontal position of a point of observation from the two observed horizontal angles subtended by three known sides of a triangle. { 'thrē ¦pȯint 'präb·ləm }

three-way switch [ELEC] An electric switch with

three terminals used to control a circuit from two different points. { 'thrē ˌwā 'swich }

threshold [BUILD] A piece of stone, wood, or metal that lies under an outside door. [ELECTR] In a modulation system, the smallest value of carrier-to-noise ratio at the input to the demodulator for all values above which a small percentage change in the input carrier-to-noise ratio produces a substantially equal or smaller percentage change in the output signal-to-noise ratio. [ENG] The least value of a current, voltage, or other quantity that produces the minimum detectable response in an instrument or system. { 'thresh,hōld }

threshold frequency [ELECTR] The frequency of incident radiant energy below which there is no photoemissive effect. { 'thresh,hōld ˌfrē·kwən·sē }

threshold speed [ENG] The minimum speed of current at which a particular current meter will measure at its rated reliability. { 'thresh,hōld ˌspēd }

threshold treatment [CHEM ENG] The process of stopping a precipitation-type reaction at the threshold of precipitate formation; used in water-treatment reactions. { 'thresh,hōld ˌtrēt·mənt }

threshold value [CONT SYS] The minimum input that produces a corrective action in an automatic control system. { 'thresh,hōld ˌval·yü }

threshold voltage [ELECTR] **1.** In general, the voltage at which a particular characteristic of an electronic device first appears. **2.** The voltage at which conduction of current begins in a *pn* junction. **3.** The voltage at which channel formation occurs in a metal oxide semiconductor field-effect transistor. **4.** The voltage at which a solid-state lamp begins to emit light. { 'thresh,hōld ˌvōl·tij }

throat [DES ENG] The narrowest portion of a constricted duct, as in a diffuser or a venturi tube; specifically, a nozzle throat. [ENG] **1.** The smaller end of a horn or tapered waveguide. **2.** The area in a fireplace that forms the passageway from the firebox to the smoke chamber. { thrōt }

throatable [DES ENG] Of a nozzle, designed to allow a change in the velocity of the exhaust stream by changing the size and shape of the throat of the nozzle. { 'thrōd·ə·bəl }

throat microphone [ENG ACOUS] A contact microphone that is strapped to the throat of a speaker and reacts directly to throat vibrations rather than to the sound waves they produce. { 'thrōt 'mī·krəˌfōn }

throttle *See* throttle valve. { 'thräd·əl }

throttle valve [MECH ENG] A choking device to regulate flow of a liquid, for example, in a pipeline, to an engine or turbine, from a pump or compressor. Also known as throttle. { 'thräd·əl 'valv }

throttling [CONT SYS] Control by means of intermediate steps between full on and full off. [THERMO] An adiabatic, irreversible process in which a gas expands by passing from one chamber to another chamber which is at a lower pressure than the first chamber. { 'thräd·əl·iŋ }

throttling calorimeter [ENG] An instrument utilizing the principle of constant enthalpy expansion for the measurement of the moisture content of steam; steam drawn from a steampipe through sampling nozzles enters the calorimeter through a throttling orifice and moves into a well-insulated expansion chamber in which its temperature is measured. Also known as steam calorimeter. { 'thräd·əl·iŋ ˌkal·əˈrim·əd·ər }

through arch [CIV ENG] An arch bridge from which the roadway is suspended as distinct from one which carries the roadway on top. { 'thrü ˌärch }

through bridge [CIV ENG] A bridge that carries the deck within the height of the superstructure. { 'thrü ˌbrij }

through-feed centerless grinding [MECH ENG] A metal cutting process by which the external surface of a cylindrical workpiece of uniform diameter is ground by passing the workpiece between a grinding and regulating wheel. { 'thrü ˌfēd 'sen·tər·ləs 'grīnd·iŋ }

throughput [CHEM ENG] The volume of feedstock charged to a process equipment unit during a specified time. { 'thrüˌpůt }

throughstone *See* bond header. { 'thrüˌstōn }

through street [CIV ENG] A street at which all cross traffic is required to stop before crossing or entering. Also known as throughway. { 'thrü ˌstrēt }

through-the-thickness braiding [ENG] A technique for preparing composite materials in which fibers are intertwined continuously, producing three-dimensional seamless patterns that resist growth of cracks and delamination in the finished parts. Also known as three-dimensional braiding. { ˌthrü thə ˈthik·nəs 'brād·iŋ }

through transmission [ENG] An ultrasonic testing method in which mechanical vibrations are transmitted into one end of the workpiece and received at the other end. { 'thrü tranzˌmish·ən }

throughway *See* expressway; through street. { 'thrüˌwā }

throw [ENG] The scattering of fragments in a blasting operation. [MECH ENG] The maximum diameter of the circle moved by a rotary part. { thrō }

throwout [MECH ENG] In automotive vehicles, the mechanism or assemblage of mechanisms by which the driven and driving plates of a clutch are separated. { 'thrōˌaůt }

throw-out spiral *See* lead-out groove. { 'thrōˌaůt ˌspī·rəl }

thrust [MECH] **1.** The force exerted in any direction by a fluid jet or by a powered screw. **2.** Force applied to an object to move it in a desired direction. [MECH ENG] The weight or pressure applied to a bit to make it cut. { thrəst }

thrust bearing [MECH ENG] A bearing which

sustains axial loads and prevents axial movement of a loaded shaft. { 'thrəst ˌber·iŋ }

thrust load [MECH ENG] A load or pressure parallel to or in the direction of the shaft of a vehicle. { 'thrəst ˌlōd }

thrust meter [ENG] An instrument for measuring static thrust, especially of a jet engine or rocket. { 'thrəst ˌmēd·ər }

thrust yoke [MECH ENG] The part connecting the piston rods of the feed mechanism on a hydraulically driven diamond-drill swivel head to the thrust block, which forms the connecting link between the yoke and the drive rod, by means of which link the longitudinal movements of the feed mechanism are transmitted to the swivel-head drive rod. Also known as back end. { 'thrəst ˌyōk }

thumbscrew [DES ENG] A screw with a head flattened in the same axis as the shaft so that it can be gripped and turned by the thumb and forefinger. { 'thəmˌskrü }

thump [ENG ACOUS] Low-frequency transient disturbance in a system or transducer characterized audibly by the vocal imitation of the word. { thəmp }

thurm [ENG] To work wood across the grain with a saw and chisel in order to produce an effect similar to turning the piece on a lathe. { thərm }

tidal lock *See* entrance lock. { 'tīd·əl 'läk }

tidal quay [CIV ENG] A quay in an open harbor or basin with sufficient depth to enable ships lying alongside to remain afloat at any state of the tide. { 'tīd·əl 'kē }

tide gage [ENG] A device for measuring the height of a tide; may be observed visually or may consist of an elaborate recording instrument. { 'tīd ˌgāj }

tide gate [CIV ENG] **1.** A restricted passage through which water runs with great speed due to tidal action. **2.** An opening through which water may flow freely when the tide sets in one direction, but which closes automatically and prevents the water from flowing in the other direction when the direction of flow is reversed. { 'tīd ˌgāt }

tide indicator [ENG] That part of a tide gage which indicates the height of tide at any time; the indicator may be in the immediate vicinity of the tidal water or at some distance from it. { 'tīd 'in·dəˌkād·ər }

tide lock *See* entrance lock. { 'tīd ˌläk }

tide machine [ENG] An instrument that computes, sometimes for years in advance, the times and heights of high and low waters at a reference station by mechanically summing the harmonic constituents of which the tide is composed. { 'tīd məˌshēn }

tide pole [ENG] A graduated spar used for measuring the rise and fall of the tide. Also known as tide staff. { 'tīd ˌpōl }

tide staff *See* tide pole. { 'tīd ˌstaf }

tie [CIV ENG] One of the transverse supports to which railroad rails are fastened to keep them to line, gage, and grade. [ELEC] **1.** Electrical connection or strap. **2.** *See* tie wire. [ENG] A beam, post, rod, or angle to hold two pieces together; a tension member in a construction. { tī }

tie bar [CIV ENG] **1.** A bar used as a tie rod. **2.** A rod connecting two switch rails on a railway to hold them to gage. { 'tī ˌbär }

tied arch [CIV ENG] An arch having the horizontal reaction component provided by a tie between the skewbacks of the arch ends. { 'tīd 'ärch }

tied concrete column [CIV ENG] A concrete column reinforced with longitudinal bars and horizontal ties. { 'tīd 'känˌkrēt 'käl·əm }

tie-down diagram [ENG] A drawing indicating the prescribed method of securing a particular item of cargo within a specific type of vehicle. { 'tīˌdaůn ˌdī·əˌgram }

tie-down point [ENG] An attachment point provided on or within a vehicle. { 'tīˌdaůn ˌpȯint }

tie-down point pattern [ENG] The pattern of tie-down points within a vehicle. { 'tīˌdaůn ˌpȯint 'pad·ərn }

tie plate [CIV ENG] A metal plate between a rail and a tie to hold the rail in place and reduce wear on the tie. [MECH ENG] A plate used in a furnace to connect tie rods. { 'tī ˌplāt }

tier building [CIV ENG] A multistory skeleton frame building. { 'tir ˌbil·diŋ }

tie rod [CIV ENG] A structural member used as a brace to take tensile loads. [ENG] A round or square iron rod passing through or over a furnace and connected with buckstays to assist in binding the furnace together. [MECH ENG] A rod used as a mechanical or structural support between elements of a machine. { 'tī ˌräd }

TIGA *See* truncated icosahedral gravitational-wave antenna. { ˌtēˌīˌjēˈā *or* 'tī·gə }

tight [ENG] **1.** Unbroken, crack-free, and solid rock in which a naked hole will stand without caving. **2.** A borehole made impermeable to water by cementation or casing. [MECH ENG] **1.** Inadequate clearance or the barest minimum of clearance between working parts. **2.** The absence of leaks in a pressure system. { tīt }

tight fit [DES ENG] A fit between mating parts with slight negative allowance, requiring light to moderate force to assemble. { 'tīt 'fit }

tilting dozer [MECH ENG] A bulldozer whose blade can be pivoted on a horizontal center pin to cut low on either side. { 'tilt·iŋ 'dō·zər }

tilting idlers [MECH ENG] An arrangement of idler rollers in which the top set is mounted on vertical arms which pivot on spindles set low down on the frame of the roller stool. { 'tilt·iŋ 'īd·lərz }

tilting mixer [MECH ENG] A small-batch mixer consisting of a rotating drum which can be tilted to discharge the contents; used for concrete or mortar. { 'tilt·iŋ 'mik·sər }

tilting-type boxcar unloader [CIV ENG] A mechanism that is used to unload material such as grain from a boxcar; the car, with its door open, is held by end clamps on the specialized piece

of track and tilted 15% from the vertical and then tilted endwise 40% to the horizontal to discharge the material at one end of the car, and 40% in the opposite direction to discharge the material from the opposite end. { 'tilt·iŋ ¦tip 'bäks,kär ən'lōd·ər }

tiltmeter [ENG] An instrument used to measure small changes in the tilt of the earth's surface, usually in relation to a liquid-level surface or to the rest position of a pendulum. { 'tilt,mēd·ər }

tilt/rotate code [ENG] A code that instructs a "golf ball" printing element which angle of tilt and rotation is needed to print a given character. { 'tilt'rō,tāt ,kōd }

tilt slab construction *See* tilt-up construction. { 'tilt ,slab kən,strək·shən }

tilt-up construction [BUILD] A method for constructing concrete wall panels by casting them horizontally adjacent to their final positions and then tilting them into vertical positions after the concrete has cured. Also known as tilt slab construction. { 'tilt,əp kən,strək·shən }

timber connector [ENG] A metal fastener that has a series of sharp teeth digging into the wood and is tightened with bolts to join sections of timber in heavy construction. { 'tim·bər kə ,nek·tər }

time and material contract [IND ENG] A contract providing for the procurement of supplies or services on the basis of direct labor hours at specified fixed hourly rates (which rates include direct and indirect labor, overhead, and profit), and material at cost. { ¦tīm ən mə'tir·ē·əl ,kän,trakt }

time and motion study [IND ENG] Observation, analysis, and measurement of the steps in the performance of a job to determine a standard time for each performance. Also known as time-motion study. { ¦tīm ən 'mō·shən ,stəd·ē }

time break [ENG] A distinctive mark shown on an exploration seismogram to indicate the exact detonation time of an explosive energy source. { 'tīm ,brāk }

time-change component [ENG] A component which because of design limitations or safety is specified to be rebuilt or overhauled after a specified period of operation (for example, an engine or propeller of an airplane). { 'tīm ¦chānj kəm,pō·nənt }

time-controlled system *See* clock control system. { 'tīm kən¦trōld ,sis·təm }

time formula [IND ENG] A formula to determine the standard time of an operation as a function of one or more variables in the operation. { 'tīm ,fór·myə·lə }

time fuse [ENG] A fuse which contains a graduated time element to regulate the time interval after which the fuse will function. { 'tīm ,fyüz }

time-interval radiosonde *See* pulse-time-modulated radiosonde. { 'tīm ,in·tər·vəl 'rād·ē·ō,sänd }

time-invariant system [CONT SYS] A system in which all quantities governing the system's behavior remain constant with time, so that the system's response to a given input does not depend on the time it is applied. { 'tīm in,ver·ē·ənt ,sis·təm }

time-motion study *See* time and motion study. { 'tīm 'mō·shən ,stəd·ē }

time of flight [MECH] Elapsed time in seconds from the instant a projectile or other missile leaves a gun or launcher until the instant it strikes or bursts. { 'tīm əv 'flīt }

time-of-flight spectrometer [ENG] Any instrument in which the speed of a particle is determined directly by measuring the time it takes to travel a measured distance. { ¦tīm əv ¦flīt spek 'träm·əd·ər }

timeout [CONT SYS] A test of the reliability of robotic software in which the robot is halted if a portion of software does not function properly until the problem is corrected. { 'tīm,aůt }

time phasing [IND ENG] Production scheduling of components for product assembly so that each component is available at the correct time. { 'tīm ,fāz·iŋ }

timer [ELECTR] A circuit used in radar and in electronic navigation systems to start pulse transmission and synchronize it with other actions, such as the start of a cathode-ray sweep. [ENG] **1.** A device for automatically starting or stopping a machine or other device. **2.** *See* interval timer. [MECH ENG] A device that controls timing of the ignition spark of an internal combustion engine at the correct time. { 'tīm·ər }

time-sharing [IND ENG] Division of the time required for observation, decision making, and responding by an operator among the activities or tasks that must be performed almost simultaneously. { 'tīm ,sher·iŋ }

time standard *See* standard time. { 'tīm ,stan·dərd }

time study [IND ENG] A work measurement technique, generally using a stopwatch or other timing device, to record the actual elapsed time for performance of a task, adjusted for any observed variance from normal effort or pace, unavoidable or machine delays, rest periods, and personal needs. { 'tīm ,stəd·ē }

time switch [ENG] A clock-controlled switch used to open or close a circuit at one or more predetermined times. { 'tīm ,swich }

time system [CONT SYS] A system of clocks and control devices, with or without a master timepiece, to indicate time at various remote locations. { 'tīm ,sis·təm }

time-varying system [CONT SYS] A system in which certain quantities governing the system's behavior change with time, so that the system will respond differently to the same input at different times. { 'tīm ¦ver·ē·iŋ ,sis·təm }

timing [MECH ENG] Adjustment in the relative position of the valves and crankshaft of an automobile engine in order to produce the largest effective output of power. { 'tīm·iŋ }

timing belt [DES ENG] A power transmission belt with evenly spaced teeth on the bottom side which mesh with grooves cut on the periphery

of the pulley to produce a positive, no-slip, constant-speed drive. Also known as cogged belt; synchronous belt. [MECH ENG] A positive drive belt that has axial cogs molded on the underside of the belt which fit into grooves on the pulley; prevents slip, and makes accurate timing possible; combines the advantages of belt drives with those of chains and gears. Also known as positive drive belt. { 'tīm·iŋ ˌbelt }

timing-belt pulley [MECH ENG] A pulley that is similar to an uncrowned flat-belt pulley, except that the grooves for the belt's teeth are cut in the pulley's face parallel to the axis. { 'tīm·iŋ ¦bəlt ˌpùl·ē }

timing gears [MECH ENG] The gear train of reciprocating engine mechanisms for relating camshaft speed to crankshaft speed. { 'tīm·iŋ ˌgirz }

timing motor [ELEC] A motor which operates from an alternating-current power system synchronously with the alternating-current frequency, used in timing and clock mechanisms. Also known as clock motor. { 'tīm·iŋ ˌmōd·ər }

Timken film strength [ENG] A test used on a gear lubricant to determine the amount of pressure the film of oil can withstand before rupturing. { 'tim·kən 'film ˌstreŋkth }

Timken wear test [ENG] A test used on a gear lubricant to determine its abrasive effect on gear metals. { 'tim·kən 'wer ˌtest }

tingle [BUILD] A support used in masonry to reduce sagging in a long layer of bricks. [DES ENG] **1.** A small nail. **2.** A flexible metal clip used to hold a sheet of material such as glass or metal. [ENG] A patch designed to cover a hole in a boat. { 'tiŋ·gəl }

tinner's rivet [DES ENG] A special-purpose rivet that has a flat head, used in sheet metal work. { 'tin·ərz ˌriv·ət }

tip [DES ENG] A piece of material secured to and differing from a cutter tooth or blade. [ELEC] The contacting part at the end of a phone plug. [ELECTR] A small protuberance on the envelope of an electron tube, resulting from the closing of the envelope after evacuation. { tip }

tipped bit [DES ENG] A drill bit in which the cutting edge is made of especially hard material. { 'tipt 'bit }

tipped solid cutters [DES ENG] Cutters made of one material and having tips or cutting edges of another material bonded in place. { 'tipt 'säl·əd 'kəd·ərz }

tipping-bucket rain gage [ENG] A type of recording rain gage; the precipitation collected by the receiver empties into one side of a chamber which is partitioned transversely at its center and is balanced bistably upon a horizontal axis; when a predetermined amount of water has been collected, the chamber tips, spilling out the water and placing the other half of the chamber under the receiver; each tip of the bucket is recorded on a chronograph, and the record obtained indicates the amount and rate of rainfall. { 'tip·iŋ ˌbək·ət 'rān ˌgāj }

tire [ENG] A continuous metal ring, or pneumatic rubber and fabric cushion, encircling and fitting the rim of a wheel. { tīr }

tire iron [DES ENG] A single metal bar having bladelike ends of various shapes to insert between the rim and the bead of a pneumatic tire to remove or replace the tire. { 'tīr ˌī·ərn }

tirrill burner [ENG] A modification of the bunsen burner which allows greater flexibility in the adjustment of the air-gas mixture. { 'tir·əl ˌbər·nər }

T junction [ELECTR] A network of waveguides with three waveguide terminals arranged in the form of a letter T; in a rectangular waveguide a symmetrical T junction is arranged by having either all three broadsides in one plane or two broadsides in one plane and the third in a perpendicular plane. { 'tē ˌjəŋk·shən }

T^2L *See* transistor-transistor logic.

TME *See* metric-technical unit of mass.

to-and-fro ropeway *See* jig back. { ¦tü ən ¦frō 'rōpˌwā }

toe [CIV ENG] The part of a base of a dam or retaining wall on the side opposite to the retained material. { tō }

toeboard [BUILD] A board placed around a platform or on a sloping roof to prevent personnel or materials from falling off. [ENG] A support or reinforcement that forms the lowest vertical face of a cabinet or similar installation, at toe level, and is frequently recessed. { 'tōˌbȯrd }

toe cut [ENG] In underground blasting, the cut obtained by the use of toe holes. { 'tō ˌkət }

toe hole [ENG] A blasting hole, usually drilled horizontally or at a slight inclination into the base of a bank, bench, or slope of a quarry or open-pit mine. { 'tō ˌhōl }

toe-in [MECH ENG] The degree (usually expressed in fractions of an inch) to which the forward part of the front wheels of an automobile are closer together than the rear part, measured at hub height with the wheels in the normal "straight ahead" position of the steering gear. { 'tō ˌin }

toenailing [ENG] The technique of driving a nail at an angle to join two pieces of lumber. { 'tōˌnāl·iŋ }

toe-out [MECH ENG] The outward inclination of the wheels of an automobile at the front on turns due to setting the steering arms at an angle. { 'tō ˌaůt }

toeplate *See* kickplate. { 'tōˌplāt }

toe-to-toe drilling [ENG] The drilling of vertical large-diameter blasting holes in quarries and opencast pits. { ¦tō tə ¦tō 'dril·iŋ }

toe wall [CIV ENG] A low wall constructed at the bottom of an embankment to prevent slippage or spreading of the soil. { 'tō ˌwȯl }

toggle [ELECTR] To switch over to an alternate state, as in a flip-flop. [MECH ENG] A form of jointed mechanism for the amplification of forces. { 'täg·əl }

toggle bolt [DES ENG] A bolt having a nut with a pair of pivotal wings that close against a spring; wings open after emergence through a hole or

passage in a thin or hollow wall to fasten the unit securely. { 'täg·əl ˌbōlt }

toggle press [MECH ENG] A mechanical press in which a toggle mechanism actuates the slide. { 'täg·əl ˌpres }

toggle switch [ELEC] A small switch that is operated by manipulation of a projecting lever that is combined with a spring to provide a snap action for opening or closing a circuit quickly. [ELECTR] An electronically operated circuit that holds either of two states until changed. { 'täg·əl ˌswich }

tolerance [DES ENG] The permissible variations in the dimensions of machine parts. [ENG] A permissible deviation from a specified value, expressed in actual values or more often as a percentage of the nominal value. { 'täl·ə·rəns }

tolerance chart [DES ENG] A chart indicating graphically the sequence in which dimensions must be produced on a part so that the finished product will meet the prescribed tolerance limits. { 'täl·ə·rəns ˌchärt }

tolerance limits [DES ENG] The extreme values (upper and lower) that are permitted by the tolerance. { 'täl·ə·rəns ˌlim·əts }

tolerance unit [DES ENG] A unit of length used to express the degree of tolerance allowed in fitting cylinders into cylindrical holes, equal, in micrometers, to 0.45 $D^{1/3}$+ 0.001 D, where D is the cylinder diameter in millimeters. { 'täl·ə·rəns ˌyü·nət }

ton [IND ENG] A unit of volume of sea freight, equal to 40 cubic feet or approximately 1.1327 cubic meters. Also known as freight ton; measurement ton; shipping ton. [MECH] **1.** A unit of weight in common use in the United States, equal to 2000 pounds or 907.18474 kilogram-force. Also known as just ton; net ton; short ton. **2.** A unit of mass in common use in the United Kingdom equal to 2240 pounds, or to 1016.0469088 kilogram-force. Also known as gross ton; long ton. **3.** A unit of weight in troy measure, equal to 2000 troy pounds, or to 746.4834432 kilogram-force. **4.** *See* tonne. [MECH ENG] A unit of refrigerating capacity, that is, of rate of heat flow, equal to the rate of extraction of latent heat when one short ton of ice of specific latent heat 144 international table British thermal units per pound is produced from water at the same temperature in 24 hours; equal to 200 British thermal units per minute, or to approximately 3516.85 watts. Also known as standard ton. { tən }

tondal [MECH] A unit of force equal to the force which will impart an acceleration of 1 foot per second to a mass of 1 long ton; equal to approximately 309.6911 newtons. { 'tənd·əl }

tongs [DES ENG] Any of various devices for holding, handling, or lifting materials and consisting of two legs joined eccentrically by a pivot or spring. { taŋz }

tongue and groove [DES ENG] A joint in which a projecting rib on the edge of one board fits into a groove in the edge of another board. { 'təŋ ən 'grüv }

ton-mile [CIV ENG] In railroading, a standard measure of traffic, based on the rate of carriage per mile of each passenger or ton of freight. { 'tən 'mīl }

tonne [MECH] A unit of mass in the metric system, equal to 1000 kilograms or to approximately 2204.62 pound mass. Also known as metric ton; millier; ton; tonneau. { tən }

tonneau *See* tonne. { tə'nō }

tool [ENG] Any device, instrument, or machine for the performance of an operation, for example, a hammer, saw, lathe, twist drill, drill press, grinder, planer, or screwdriver. [IND ENG] To equip a factory or industry for production by designing, making, and integrating machines, machine tools, and special dies, jigs, and instruments, so as to achieve manufacture and assembly of products on a volume basis at minimum cost. { tül }

tool bit [ENG] A piece of high-strength metal, usually steel, ground to make single-point cutting tools for metal-cutting operations. { 'tül ˌbit }

toolbox [ENG] A box to hold tools. { 'tül ˌbäks }

tool-center point [CONT SYS] The location on the end effector or tool of a robot manipulator whose position and orientation define the coordinates of the controlled object. { 'tül 'sen·tər ˌpȯint }

tool changer [MECH ENG] In program-controlled machines and robotics, a mechanism that allows the use of multiple tools. { 'tül ˌchānj·ər }

tool-check system [IND ENG] A system for temporary issue of tools in which the employee is issued a number of small metal checks stamped with the same number; a check is surrendered for each tool obtained from the crib. { 'tül ˌchek ˌsis·təm }

tool design [DES ENG] The division of mechanical design concerned with the design of tools. { 'tül di¦zīn }

tool-dresser [MECH ENG] A tool-stone-grade diamond inset in a metal shank and used to trim or form the face of a grinding wheel. { 'tül ˌdres·ər }

tool extractor [ENG] An implement for grasping and withdrawing drilling tools when broken, detached, or lost in a borehole. { 'tül ik¦strak·tər }

tool-function controller [CONT SYS] A unit that selects and controls tools for machining operations; it may be internal or external to the main controller. { 'tül ¦fəŋk·shən kən'trōl·ər }

toolhead [MECH ENG] The adjustable tool-carrying part of a machine tool. { 'tülˌhed }

tooling [MECH ENG] Tools or end effectors with which a robot performs the actual work on a workpiece. { 'tül·iŋ }

tool joint [ENG] A coupling element for a drill pipe; designed to support the weight of the drill stem and the strain of frequent use, and to provide a leakproof seal. { 'tül ˌjȯint }

tool-length compensation [CONT SYS] Programming of machining operations so that all

tools are positioned correctly in advance for any tasks to be carried out. { 'tül ¦leŋkth ˌkäm·pən'sā·shən }

toolmaker's vise *See* universal vise. { 'tülˌmäk·ərz ˌvīs }

tool offset [MECH ENG] The adjustment of tool positions in machines to compensate for their wear, finishing, or displacement from an axis. { 'tül 'ȯfˌset }

tool post [MECH ENG] A device to clamp and position a tool holder on a machine tool. { 'tül ˌpōst }

tooth [DES ENG] **1.** One of the regular projections on the edge or face of a gear wheel. **2.** An angular projection on a tool or other implement, such as a rake, saw, or comb. { 'tüth }

tooth point [DES ENG] The chamfered cutting edge of the blade of a face mill. { 'tüth ˌpȯint }

top [MECH] A rigid body, one point of which is held fixed in an inertial reference frame, and which usually has an axis of symmetry passing through this point; its motion is usually studied when it is spinning rapidly about the axis of symmetry. { täp }

top dead center [MECH ENG] The dead-center position of an engine piston and its crankshaft arm when at the top or outer end of its stroke. { ¦täp 'ded 'sen·tər }

top-down design [IND ENG] A design methodology that proceeds from the highest level to the lowest and from the general to the particular, and that provides a formal mechanism for breaking complex process designs into functional descriptions, reviewing progress, and allowing modifications. { 'täp ¦daůn di'zīn }

topographic survey [ENG] A survey that determines ground relief and location of natural and man-made features thereon. { ¦täp·əˌgraf·ik 'sərˌvā }

topping [CHEM ENG] The distillation of crude petroleum to remove the light fractions only; the unrefined distillate is called tops. [CIV ENG] A layer of mortar placed over concrete to form a finishing surface on a floor, driveway, sidewalk, or curb. { 'täp·iŋ }

topping governor *See* limit governor. { 'täp·iŋ ˌgəv·ə·nər }

topping joint [CIV ENG] In concrete finishing, a small space or break set at regular intervals, particularly over expansion joints, to allow for contraction and expansion of the topping layer. { 'täp·iŋ ˌjȯint }

top plate [BUILD] **1.** The top horizontal member of a building frame to which the rafters are fastened. **2.** The horizontal member of a building frame at the top of the partition studs. { 'täp ˌplāt }

topple [MECH] In gyroscopes for marine or aeronautical use, the condition of a sudden upset gyroscope or a gyroscope platform evidenced by a sudden and rapid precession of the spin axis due to large torque disturbances such as the spin axis striking the mechanical stops. Also known as tumble. { 'täp·əl }

topple axis [MECH] Of a gyroscope, the horizontal axis, perpendicular to the horizontal spin axis, around which topple occurs. Also known as tumble axis. { 'täp·əl ˌak·səs }

top rail [BUILD] The uppermost horizontal member of a unit of framing, such as a door or a sash. { 'täp ˌrāl }

top steam [CHEM ENG] Steam admitted near the top of a shell still to purge the still, and to prevent a vacuum from forming when pumping out the liquid contents. { 'täp ˌstēm }

tor *See* pascal. { tȯr }

torch [BUILD] To apply lime mortar under the top edges of roof tiles or slates. [ENG] A gas burner used for brazing, cutting, or welding. { tȯrch }

tornado cellar *See* cyclone cellar. { tȯr'nād·ō ˌsel·ər }

toromatic transmission [MECH ENG] A semiautomatic transmission; it contains a compound planetary gear train with a torque converter. { ¦tȯr·əˌmad·ik tranz'mish·ən }

torpedo [ENG] An encased explosive charge slid, lowered, or dropped into a borehole and exploded to clear the hole of obstructions or to open communications with an oil or water supply. Also known as bullet. { tȯr'pēd·ō }

torque [MECH] **1.** For a single force, the cross product of a vector from some reference point to the point of application of the force with the force itself. Also known as moment of force; rotation moment. **2.** For several forces, the vector sum of the torques (first definition) associated with each of the forces. { tȯrk }

torque arm [MECH ENG] In automotive vehicles, an arm to take the torque of the rear axle. { 'tȯrk ˌärm }

torque-coil magnetometer [ENG] A magnetometer that depends for its operation on the torque developed by a known current in a coil that can turn in the field to be measured. { 'tȯrk ˌkȯil ˌmag·nə'täm·əd·ər }

torque converter [MECH ENG] A device for changing the torque speed or mechanical advantage between an input shaft and an output shaft. { 'tȯrk kənˌvərd·ər }

torque-load characteristic [ENG] For electric motors, the armature torque developed versus the load on the motor at constant speed. { 'tȯrk ¦lōd ˌkar·ik·tə,ris·tik }

torquemeter [ENG] An instrument to measure torque. { 'tȯrkˌmēd·ər }

torque reaction [MECH ENG] On a shaft-driven vehicle, the reaction between the bevel pinion with its shaft (which is supported in the rear axle housing) and the bevel ring gear (which is fastened to the differential housing) that tends to rotate the axle housing around the axle instead of rotating the axle shafts alone. { 'tȯrk rēˌak·shən }

torque ripple *See* cog. { 'tȯrk ˌrip·əl }

torque-tube flowmeter [ENG] A liquid-flow measurement device in which a flexible torque tube transmits bellows motion (caused by differential pressure from the liquid flow through the

pipe) to the recording pen arm. { 'tȯrk ¦tüb 'flō ˌmēd·ər }

torque-type viscometer [ENG] A device that measures liquid viscosity by the torque needed to rotate a vertical paddle submerged in the liquid; used for both Newtonian and non-Newtonian liquids and for suspensions. { 'tȯrk ¦tīp vi'skäm·əd·ər }

torque-winding diagram [MECH ENG] A diagram showing how the winding load on a winch drum varies and is used to decide the method of balancing needed; made by plotting the turning moment in pounds per foot on the vertical axis against time, or revolutions or depth on the horizontal axis. { 'tȯrk ¦wīnd·iŋ ˌdī·əˌgram }

torque wrench [ENG] **1.** A hand or power tool used to turn a nut on a bolt that can be adjusted to deliver a predetermined amount of force to the bolt when tightening the nut. **2.** A wrench that measures torque while being turned. { 'tȯrk ˌrench }

torr [MECH] A unit of pressure, equal to 1/760 atmosphere; it differs from 1 millimeter of mercury by less than one part in seven million; approximately equal to 133.3224 pascals. { tȯr }

Torricellian barometer *See* mercury barometer. { ¦tȯr·əˈchel·ē·ən bə'räm·əd·ər }

torsel [BUILD] A section of wood, stone, or steel that supports one end of a beam or joist and distributes the load. { 'tȯr·səl }

torsiometer [MECH ENG] An instrument which measures power transmitted by a rotating shaft; consists of angular scales mounted around the shaft from which twist of the loaded shaft is determined. Also known as torsionmeter. { ˌtȯr·shē'äm·əd·ər }

torsion [MECH] A twisting deformation of a solid body about an axis in which lines that were initially parallel to the axis become helices. { 'tȯr·shən }

torsional angle [MECH] The total relative rotation of the ends of a straight cylindrical bar when subjected to a torque. { 'tȯr·shən·əl 'aŋ·gəl }

torsional compliance [MECH] The reciprocal of the torsional rigidity. { ¦tȯr·shə·nəl kəm'pli·əns }

torsional hysteresis [MECH] Dependence of the torques in a twisted wire or rod not only on the present torsion of the object but on its previous history of torsion. { ¦tȯr·shə·nəl ˌhis·tə'rē·səs }

torsional modulus [MECH] The ratio of the torsional rigidity of a bar to its length. Also known as modulus of torsion. { 'tȯr·shən·əl 'mäj·ə·ləs }

torsional pendulum [MECH] A device consisting of a disk or other body of large moment of inertia mounted on one end of a torsionally flexible elastic rod whose other end is held fixed; if the disk is twisted and released, it will undergo simple harmonic motion, provided the torque in the rod is proportional to the angle of twist. Also known as torsion pendulum. { 'tȯr·shən·əl 'pen·jə·ləm }

torsional rigidity [MECH] The ratio of the torque applied about the centroidal axis of a bar at one end of the bar to the resulting torsional angle, when the other end is held fixed. { 'tȯr·shən·əl ri'jid·əd·ē }

torsional vibration [MECH] A periodic motion of a shaft in which the shaft is twisted about its axis first in one direction and then in the other; this motion may be superimposed on rotational or other motion. { 'tȯr·shən·əl vī'brā·shən }

torsion balance [ENG] An instrument, consisting essentially of a straight vertical torsion wire whose upper end is fixed while a horizontal beam is suspended from the lower end; used to measure minute gravitational, electrostatic, or magnetic forces. { 'tȯr·shən ˌbal·ənS }

torsion bar [MECH ENG] A spring flexed by twisting about its axis; found in the spring suspension of truck and passenger car wheels, in production machines where space limitations are critical, and in high-speed mechanisms where inertia forces must be minimized. { 'tȯr·shən ˌbär }

torsion damper [MECH ENG] A damper used on automobile internal combustion engines to reduce torsional vibration. { 'tȯr·shən ˌdam·pər }

torsion function [MECH] A harmonic function, $\phi(x,y) = w/\tau$, expressing the warping of a cylinder undergoing torsion, where the x, y, and z coordinates are chosen so that the axis of torsion lies along the z axis, w is the z component of the displacement, and τ is the torsion angle. Also known as warping function. { 'tȯr·shən ˌfəŋk·shən }

torsion galvanometer [ENG] A galvanometer in which the force between the fixed and moving systems is measured by the angle through which the supporting head of the moving system must be rotated to bring the moving system back to its zero position. { 'tȯr·shən ˌgal·və'näm·əd·ər }

torsion hygrometer [ENG] A hygrometer in which the rotation of the hygrometric element is a function of the humidity; such hygrometers are constructed by taking a substance whose length is a function of the humidity and twisting or spiraling it under tension in such a manner that a change in length will cause a further rotation of the element. { 'tȯr·shən hī'gräm·əd·ər }

torsionmeter *See* torsiometer. { 'tȯr·shənˌmēd·ər }

torsion pendulum *See* torsional pendulum. { 'tȯr·shən 'pen·jə·ləm }

torsion-string galvanometer [ENG] A sensitive galvanometer in which the moving system is suspended by two parallel fibers that tend to twist around each other. { 'tȯr·shən ¦striŋ ˌgal·və'näm·əd·ər }

total air [ENG] The actual quantity of air supplied for combustion of fuel in a boiler, expressed as a percentage of theoretical air. { 'tōd·əl 'er }

total coincidence [MECH ENG] The condition in which all the joints of a robot become locked in position. { 'tōd·əl kō'in·səd·əns }

total heat *See* enthalpy. { 'tōd·əl 'hēt }

total pressure [MECH] The gross load applied on a given surface. { 'tōd·əl 'presh·ər }

total quality management [SYS ENG] A philosophy and set of guiding concepts that provides a comprehensive means of improving total organization performance and quality by examining each process through which work is done in a systematic, integrated, consistent, organization-wide manner. Abbreviated TQM. { ¦tōd·əl 'kwäl·əd·ē ˌman·ij·mənt }

total radiation pyrometer [ENG] A pyrometer which focuses heat radiation emitted by a hot object on a detector (usually a thermopile or other thermal type detector), and which responds to a broad band of radiation, limited only by absorption of the focusing lens, or window and mirror. { 'tōd·əl 'rād·ē¦ā·shən pī'räm·əd·ər }

touch feedback [ENG] A type of force feedback in which servos provide the manipulator fingers with a sense of resistance when an object is grasped, so that the operator does not crush the object. { 'təch ˌfēdˌbak }

touch sensor [CONT SYS] A device such as a small, force-sensitive switch that uses contact to generate feedback in robotic systems. { 'təch ˌsen·sər }

toughness [MECH] A property of a material capable of absorbing energy by plastic deformation; intermediate between softness and brittleness. { 'təf·nəs }

tow [ENG] **1.** To haul by a rope or chain, for example, to haul a disabled ship by another vessel or an automotive vehicle by another vehicle. **2.** To propel by pushing, as a tugboat piloting a ship. { tō }

towbar [ENG] An element which connects to a vehicle that is not equipped with an integral drawbar, for the purpose of towing or moving the vehicle. { 'tōˌbär }

towed load [MECH] The weight of a carriage, trailer, or other equipment towed by a prime mover. { 'tōd 'lōd }

tower [CHEM ENG] A vertical, cylindrical vessel used in chemical and petroleum processing to increase the degree of separation of liquid mixtures by distillation or extraction. Also known as column. [ENG] A concrete, metal, or timber structure that is relatively high for its length and width, and used for various purposes, including the support of electric power transmission lines, radio and television antennas, and rockets and missiles prior to launching. { taù·ər }

tower bolt *See* barrel bolt. { 'taù·ər ˌbōlt }

tower crane [CIV ENG] A crane mounted on top of a tower which is sometimes incorporated in the frame of a building. { 'taù·ər ˌkrān }

towing tank *See* model basin. { 'tō·iŋ ˌtaŋk }

Townsend avalanche *See* avalanche. { 'taùn·zənd ˌav·əˌlanch }

TPR *See* airborne profile recorder.

TQM *See* total quality management.

trace [ELECTR] The visible path of a moving spot on the screen of a cathode-ray tube. Also known as line. [ENG] The record made by a recording device, such as a seismometer or electrocardiograph. { trās }

trace heating [ENG] Heating the layer between insulation and pipes in an insulated pipework system to reduce viscosity and thereby facilitate flow of the liquid. { ¦trās ¦hēd·iŋ }

tracer [ENG] A thread of contrasting color woven into the insulation of a wire for identification purposes. { 'trā·sər }

tracer gas [ENG] In vacuum testing for leaks, a gas emitting through a leak in a pressure system and subsequently conducted into the detector. { 'trā·sər ˌgas }

tracer milling [MECH ENG] Cutting a duplicate of a three-dimensional form by using a mastic form to direct the tracer-controlled cutter. { 'trā·sər ˌmil·iŋ }

tracing distortion [ENG ACOUS] The nonlinear distortion introduced in the reproduction of a mechanical recording because the curve traced by the motion of the reproducing stylus is not an exact replica of the modulated groove. { 'trās·iŋ diˌstȯr·shən }

track [DES ENG] As applied to a pattern of setting diamonds in a bit crown, an arrangement of diamonds in concentric circular rows in the bit crown, with the diamonds in a specific row following in the track cut by a preceding diamond. [ELECTR] **1.** A path for recording one channel of information on a magnetic tape, drum, or other magnetic recording medium; the location of the track is determined by the recording equipment rather than by the medium. **2.** The trace of a moving target on a plan-position-indicator radar screen or an equivalent plot. [ENG] **1.** The groove cut in a rock by a diamond inset in the crown of a bit. **2.** A pair of parallel metal rails for a railway, railroad, tramway, or for any wheeled vehicle. [MECH ENG] **1.** The slide or rack on which a diamond-drill swivel head can be moved to positions above and clear of the collar of a borehole. **2.** A crawler mechanism for earth-moving equipment. Also known as crawler track. { trak }

track cable [ENG] Steel wire rope, usually a locked-coil rope which supports the wheels of the carriers of a cableway. { 'trak ˌkā·bəl }

track gage [CIV ENG] The width between the rails of a railroad track; in the United States the standard gage is 4 feet $8\frac{1}{2}$ inches. { 'trak ˌgāj }

track hopper [ENG] A hopper-shaped receiver mounted beside or below railroad tracks, into which railroad boxcars or bottom-dump cars are discharged; used for solid materials. { 'trak ˌhäp·ər }

tracking [ELEC] A leakage or fault path created across the surface of an insulating material when a high-voltage current slowly but steadily forms a carbonized path. [ELECTR] The condition in which all tuned circuits in a receiver accurately follow the frequency indicated by the tuning dial over the entire tuning range. [ENG] **1.** A motion given to the major lobe of a radar or radio antenna such that some preassigned moving target in space is always within the major lobe.

2. The process of following the movements of an object; may be accomplished by keeping the reticle of an optical system or a radar beam on the object, by plotting its bearing and distance at frequent intervals, or by a combination of techniques. [ENG ACOUS] **1.** The following of a groove by a phonograph needle. **2.** Maintaining the same ratio of loudness in the two channels of a stereophonic sound system at all settings of the ganged volume control. { 'trak·iŋ }

tracking error [ENG ACOUS] Deviation of the vibration axis of a phonograph pickup from tangency with a groove; true tangency is possible for only one groove when the pickup arm is pivoted; the longer the pickup arm, the less is the tracking error. { 'trak·iŋ ˌer·ər }

tracking jitter [ENG] Minor variations in the pointing of an automatic tracking radar. { 'trak·iŋ ˌjid·ər }

tracking network [ENG] A group of tracking stations whose operations are coordinated in tracking objects through the atmosphere or space. { 'trak·iŋ ˌnetˌwərk }

tracking problem [CONT SYS] The problem of determining a control law which when applied to a dynamical system causes its output to track a given function; the performance index is in many cases taken to be of the integral square error variety. { 'trak·iŋ ˌpräb·ləm }

tracking radar [ENG] Radar used to monitor the flight and obtain geophysical data from space probes, satellites, and high-altitude rockets. { 'trak·iŋ ˌrāˌdär }

tracking station [ENG] A radio, radar, or other station set up to track an object moving through the atmosphere or space. { 'trak·iŋ ˌstā·shən }

tracking system [ENG] Apparatus, such as tracking radar, used in following and recording the position of objects in the sky. { 'trak·iŋ ˌsis·təm }

trackshifter [ENG] A machine or appliance used to shift a railway track laterally. { 'trakˌshif·tər }

traction [MECH] Pulling friction of a moving body on the surface on which it moves. { 'trak·shən }

traction-control system [MECH ENG] An acceleration sensor-control system which, when a driving tire has no traction, slows the wheel movement by braking or reduces the engine speed and torque if braking alone will not prevent wheel spin. { 'trak·shən kən'trōl ˌsis·təm }

traction meter [ENG] A load-sensing device placed between a locomotive and the car immediately behind it to measure pulling force exerted by the locomotive. { 'trak·shən ˌmēd·ər }

traction tube [ENG] A device for measuring the minimum water velocities capable of moving various sizes of sand grains; it consists of a horizontal glass tube half-filled with sand. { 'trak·shən ˌtüb }

tractor [MECH ENG] **1.** An automotive vehicle having four wheels or a caterpillar tread used for pulling agricultural or construction implements. **2.** The front pulling section of a semitrailer. Also known as truck-tractor. { 'trak·tər }

tractor drill [MECH ENG] A drill having a crawler mounting to support the feed-guide bar on an extendable arm. { 'trak·tər ¦dril }

tractor gate [CIV ENG] A type of outlet control gate used to release water from a reservoir; there are two types, roller and wheel. { 'trak·tər ˌgāt }

tractor loader [MECH ENG] A tractor equipped with a tipping bucket which can be used to dig and elevate soil and rock fragments to dump at truck height. Also known as shovel dozer; tractor shovel. { 'trak·tər ¦lōd·ər }

tractor shovel *See* tractor loader. { 'trak·tər ¦shəv·əl }

traffic [ENG] The passage or flow of vehicles, pedestrians, ships, or planes along defined routes such as highways, sidewalks, sea lanes, or air lanes. { 'traf·ik }

trafficability [CIV ENG] Capability of terrain to bear traffic, or the extent to which the terrain will permit continued movement of any or all types of traffic. { ˌtraf·ə·kə'bil·əd·ē }

traffic control [ENG] Control of the movement of vehicles, such as airplanes, trains, and automobiles, and the regulatory mechanisms and systems used to exert or enforce control. { 'traf·ik kənˌtrōl }

traffic cop [CONT SYS] The portion of a programmable controller's executive program concerned with input/output. { 'traf·ik ˌkäp }

traffic density [CIV ENG] The average number of vehicles that occupy 1 mile or 1 kilometer of road space, expressed in vehicles per mile or per kilometer. { 'traf·ik ˌden·səd·ē }

traffic engineering [CIV ENG] The determination of the required capacity and layout of highway and street facilities that can safely and economically serve vehicular movement between given points. { 'traf·ik ˌen·jəˌnir·iŋ }

traffic flow [CIV ENG] The total number of vehicles passing a given point in a given time, expressed as vehicles per hour. { 'traf·ik ˌflō }

traffic noise [ENG] The general disturbance in sonar transmissions which is due to ships but is not associated with a specific vessel. { 'traf·ik ˌnȯiz }

traffic recorder [ENG] A mechanical counter or recorder used to determine traffic movements (hourly variations and total daily volumes of traffic at a point) on an existing route; the air-impulse counter, magnetic detector, photoelectric counter, and radar detector are used. { 'traf·ik riˌkȯrd·ər }

traffic signal [CIV ENG] With the exception of traffic signs, any power-operated device for regulating, directing, or warning motorists or pedestrians. { 'traf·ik ˌsig·nəl }

T rail [CIV ENG] A rail shaped like a T in cross section due to a wide head, web, and flanged base. { 'tē ˌrāl }

trailer [ELECTR] A bright streak at the right of a dark area or dark line in a television picture, or a dark area or streak at the right of a bright part; usually due to insufficient gain at low video frequencies. [MECH ENG] The section of a

semitrailer that is pulled by the tractor. { 'trā·lər }

trail formation [ENG] Vehicles proceeding one behind the other at designated intervals. Also known as column formation. { 'trāl fȯr,mā·shən }

trailing edge [ELECTR] The major portion of the decay of a pulse. { 'trāl·iŋ 'ej }

train [ENG] To aim or direct a radar antenna in azimuth. { trān }

training aid [ENG] Any item which is developed or procured primarily to assist in training and the process of learning. { 'trān·iŋ ˌād }

training data [CONT SYS] Data entered into a robot's computer at the beginning of an operation. { 'trān·iŋ ˌdad·ə }

training wall [CIV ENG] A wall built along the bank of a river or estuary parallel to the direction of flow to direct and confine the flow. { 'trān·iŋ ˌwȯl }

train shed [CIV ENG] **1.** A structure to protect trains from weather. **2.** The part of a railroad station that covers the tracks. { 'trān ˌshed }

trajectory [MECH] The curve described by an object moving through space, as of a meteor through the atmosphere, a planet around the sun, a projectile fired from a gun, or a rocket in flight. { trə'jek·trē }

trajectory control [CONT SYS] A type of continuous-path control in which a robot's path is calculated based on mathematical models of joint acceleration, arm loads, and actuating signals. { trə'jek·trē kən,trōl }

trajectory-measuring system [ENG] A system used to provide information on the spatial position of an object at discrete time intervals throughout a portion of the trajectory or flight path. { trə'jek·trē ˌmezh·ə·riŋ ˌsis·təm }

trammel [ENG] A device consisting of a bar, each of whose ends is constrained to move along one of two perpendicular lines; used in drawing ellipses and in the Rowland mounting. { 'tram·əl }

tramway [MECH ENG] An overhead rail, rope, or cable on which wheeled cars run to convey a load. { 'tramˌwā }

transceiver [ELECTR] A radio transmitter and receiver combined in one unit and having switching arrangements such as to permit both transmitting and receiving. Also known as transmitter-receiver. { tran'sē·vər }

transcription [ENG ACOUS] A recording of a complete radio program, made especially for broadcast purposes. Also known as electrical transcription. { tranz'krip·shən }

transducer [ENG] Any device or element which converts an input signal into an output signal of a different form; examples include the microphone, phonograph pickup, loudspeaker, barometer, photoelectric cell, automobile horn, doorbell, and underwater sound transducer. { tranz 'dü·sər }

transfer caliper [DES ENG] A caliper having one leg which can be opened (or closed) to remove the instrument from the piece being measured; used to measure inside recesses or over projections. { 'tranz·fər ˌkal·ə·pər }

transfer case [MECH ENG] In a vehicle with more than one driving axle, a housing fitted with gears that distribute the driving power among the axles. { 'tranz·fər ˌkās }

transfer chamber [ENG] In plastics processing, a vessel in which thermosetting plastic is softened by heat and pressure before being placed in a closed mold for final curing. { 'tranz·fər ˌchām·bər }

transfer chute [ENG] A chute used at a transfer point in a conveyor system; the chute is designed with a curved base or some other feature so that the load be discharged in a centralized stream and in the same direction as the receiving conveyor. { 'tranz·fər ˌshüt }

transfer constant [ENG] A transducer rating, equal to one-half the natural logarithm of the complex ratio of the product of the voltage and current entering a transducer to that leaving the transducer when the latter is terminated in its image impedance; alternatively, the product may be that of force and velocity or pressure and volume velocity; the real part of the transfer constant is the image attenuation constant, and the imaginary part is the image phase constant. Also known as transfer factor. { 'tranz·fər ˌkän·stənt }

transfer factor *See* transfer constant. { 'tranz·fər ˌfak·tər }

transfer function [CONT SYS] The mathematical relationship between the output of a control system and its input: for a linear system, it is the Laplace transform of the output divided by the Laplace transform of the input under conditions of zero initial-energy storage. { 'tranz·fər ˌfəŋk·shən }

transfer grille [ENG] In an air-conditioning system, a grille that permits air to flow from one space to another; may be one of a pair if installed on opposite sides of a wall or door. { 'tranz·fər ˌgril }

transfer machine [MECH ENG] **1.** Equipment that moves parts from one production location in a factory to another. **2.** A device that holds a workpiece and moves it automatically through the stages of a manufacturing process. { 'tranz·fər mə,shēn }

transfer matrix [CONT SYS] The generalization of the concept of a transfer function to a multivariable system; it is the matrix whose product with the vector representing the input variables yields the vector representing the output variables. { 'tranz·fər ˌmā·triks }

transfer-matrix method [MECH] A method of analyzing vibrations of complex systems, in which the system is approximated by a finite number of elements connected in a chainlike manner, and matrices are constructed which can be used to determine the configuration and forces acting on one element in terms of those on another. { 'tranz·fər ˌmā·triks ˌmeth·əd }

transfer molding [ENG] Molding of thermosetting materials in which the plastic is softened

by heat and pressure in a transfer chamber, then forced at high pressure through suitable sprues, runners, and gates into a closed mold for final curing. { 'tranz·fər ˌmōld·iŋ }

transfer ratio [ENG] From one point to another in a transducer at a specified frequency, the complex ratio of the generalized force or velocity at the second point to the generalized force or velocity applied at the first point; the generalized force or velocity includes not only mechanical quantities, but also other analogous quantities such as acoustical and electrical; the electrical quantities are usually electromotive force and current. { 'tranz·fər ˌrā·shō }

transfer register [ENG] A transfer grille fitted with a mechanism for controlling the volume of airflow. { 'tranz·fər ˌrej·ə·stər }

transfer robot [CONT SYS] A fixed-sequence robot that moves parts from one location to another. { 'tranz·fər 'rōˌbät }

transfer unit [CHEM ENG] The relationship between the overall rate coefficient (for whatever transfer operation is being calculated), column volume, and fluid volumetric flow rate in fixed-bed sorption operations. { 'tranz·fər ˌyü·nət }

transformation [ELEC] For two networks which are equivalent as far as conditions at the terminals are concerned, a set of equations giving the admittances or impedances of the branches of one circuit in terms of the admittances or impedances of the other. { ˌtranz·fər'mā·shən }

transformer loss [ELEC] Ratio of the signal power that an ideal transformer of the same impedance ratio would deliver to the load impedance, to the signal power that the actual transformer delivers to the load impedance; this ratio is usually expressed in decibels. { tranz'fȯr·mər ˌlȯs }

transformer substation [ELEC] An electric power substation whose equipment includes transformers. { tranz'fȯr·mər 'səbˌstā·shən }

transient grating photoacoustics *See* impulsive stimulated thermal scattering. { ˌtranch·ənt ¦grād·iŋ ˌfōd·ō·ə'kü·stiks }

transillumination [ENG] **1.** Indirect lighting on a console panel that uses edge and backlighting techniques on clear, fluorescent, or layered plastic materials. **2.** Transmission of light through sections of material in order to enhance inspection for deviations in quality. { ˌtranz·əˌlü·mə'nā·shən }

transistance [ELECTR] The characteristic that makes possible the control of voltages or currents so as to accomplish gain or switching action in a circuit; examples of transistance occur in transistors, diodes, and saturable reactors. { tran'zis·təns }

transistor [ELECTR] An active component of an electronic circuit consisting of a small block of semiconducting material to which at least three electrical contacts are made, usually two closely spaced rectifying contacts and one ohmic (nonrectifying) contact; it may be used as an amplifier, detector, or switch. { tran'zis·tər }

transistor amplifier [ELECTR] An amplifier in which one or more transistors provide amplification comparable to that of electron tubes. { tran'zis·tər ˌam·pləˌfī·ər }

transistor biasing [ELECTR] Maintaining a direct-current voltage between the base and some other element of a transistor. { tran'zis·tər ˌbī·əs·iŋ }

transistor characteristics [ELECTR] The values of the impedances and gains of a transistor. { tran'zis·tər ˌkar·ik·tə·ris·tiks }

transistor chip [ELECTR] An unencapsulated transistor of very small size used in microcircuits. { tran'zis·tər ˌchip }

transistor circuit [ELECTR] An electric circuit in which a transistor is connected. { tran'zis·tər ˌsər·kət }

transistor gain [ELECTR] The increase in signal power produced by a transistor. { tran'zis·tər ˌgān }

transistor input resistance [ELECTR] The resistance across the input terminals of a transistor stage. Also known as input resistance. { tran'zis·tər 'inˌpůt riˌzis·təns }

transistor-transistor logic [ELECTR] A logic circuit containing two transistors, for driving large output capacitances at high speed. Abbreviated T^2L; TTL. { tran'zis·tər tran'zis·tər 'läj·ik }

transit [ENG] **1.** A surveying instrument with the telescope mounted so that it can measure horizontal and vertical angles. Also known as transit theodolite. **2.** To reverse the direction of the telescope of a transit by rotating 180° about its horizontal axis. Also known as plunge. { 'trans·ət }

transit circle [ENG] A type of astronomical transit instrument having a micrometer eyepiece that has an extra pair of moving wires perpendicular to the vertical set to measure the zenith distance or declination of the celestial object in conjunction with readings taken from a large, accurately calibrated circle attached to the horizontal axis. Also known as meridian circle; meridian transit. { 'trans·ət ˌsər·kəl }

transit declinometer [ENG] A type of declinometer; a surveyor's transit, built to exacting specifications with respect to freedom from traces of magnetic impurities and quality of the compass needle, has a 17-power telescope for sighting on a mark and for making solar and stellar observations to determine true directions. { 'trans·ət ˌdek·lə'näm·əd·ər }

transition [THERMO] A change of a substance from one of the three states of matter to another. { tran'zish·ən }

transitional fit [DES ENG] A fit with varying clearances due to specified tolerances on the shaft and sleeve or hole. { tran'zish·ən·əl 'fit }

transition curve *See* easement curve. { tran'zish·ən ˌkərv }

transition factor *See* reflection factor. { tran'zish·ən ˌfak·tər }

transition frequency [ENG ACOUS] The frequency corresponding to the intersection of the asymptotes to the constant-amplitude and

constant-velocity portions of the frequency-response curve for a disk recording; this curve is plotted with output-voltage ratio in decibels as the ordinate, and the logarithm of the frequency as the abscissa. Also known as crossover frequency; turnover frequency. { tran'zish·ən ˌfrē·kwən·sē }

transition loss [ELEC] At a junction between a source and a load, the ratio of the available power to the power delivered to the load. { tran'zish·ən ˌlós }

transition point [THERMO] Either the temperature at which a substance changes from one state of aggregation to another (a first-order transition), or the temperature of culmination of a gradual change, such as the lambda point, or Curie point (a second-order transition). Also known as transition temperature. { tran'zish·ən ˌpȯint }

transition temperature *See* transition point. { tran'zish·ən ˌtem·prə·chər }

transit survey [ENG] A ground surveying method in which a transit instrument is set up at a control point and oriented, and directions and distances to observed points are recorded. { 'trans·ət 'sərˌvā }

transit theodolite *See* transit. { 'trans·ət thē'äd·əˌlīt }

translation [MECH] The linear movement of a point in space without any rotation. { tran'slā·shən }

translational motion [MECH] Motion of a rigid body in such a way that any line which is imagined rigidly attached to the body remains parallel to its original direction. { tran'slā·shən·əl 'mō·shən }

transmembrane distillation *See* membrane distillation. { ˌtranzˌmemˌbrān ˌdis·tə'lā·shən }

transmissibility [MECH] A measure of the ability of a system either to amplify or to suppress an input vibration, equal to the ratio of the response amplitude of the system in steady-state forced vibration to the excitation amplitude; the ratio may be in forces, displacements, velocities, or accelerations. { tranzˌmis·ə'bil·əd·ē }

transmission [ELECTR] **1.** The process of transferring a signal, message, picture, or other form of intelligence from one location to another location by means of wire lines, radio, light beams, infrared beams, or other communication systems. **2.** A message, signal, or other form of intelligence that is being transmitted. [MECH ENG] The gearing system by which power is transmitted from the engine to the live axle in an automobile. Also known as gearbox. { tranz'mish·ən }

transmission access [ELEC] The use of electric power lines and other power transmitting facilities by parties other than the owners of the lines. Also known as common carriage. { tranz'mish·ən 'akˌses }

transmission dynamometer [ENG] A device for measuring torque and power (without loss) between a propulsion power plant and the driven mechanism, for example, wheels or propellers. { tranz'mish·ən ˌdī·nə'mäm·əd·ər }

transmission line [ELEC] A system of conductors, such as wires, waveguides, or coaxial cables, suitable for conducting electric power or signals efficiently between two or more terminals. { tranz'mish·ən ˌlīn }

transmission-line admittance [ELEC] The complex ratio of the current flowing in a transmission line to the voltage across the line, where the current and voltage are expressed in phasor notation. { tranz'mish·ən ¦līn adˌmit·əns }

transmission-line attenuation [ELEC] The decrease in power of a transmission-line signal from one point to another, expressed as a ratio or in decibels. { tranz'mish·ən ¦līn əˌten·yəˌwā·shən }

transmission-line cable [ELEC] The coaxial cable, waveguide, or microstrip which forms a transmission line; a number of standard types have been designated, specified by size and materials. { tranz'mish·ən ¦līn ˌkā·bəl }

transmission-line constants *See* transmission-line parameters. { tranz'mish·ən ¦līn ˌkän·stəns }

transmission-line current [ELEC] The amount of electrical charge which passes a given point in a transmission line per unit time. { tranz 'mish·ən ¦līn ˌkə·rənt }

transmission-line efficiency [ELEC] The ratio of the power of a transmission-line signal at one end of the line to that at the other end where the signal is generated. { tranz'mish·ən ¦līn iˌfish·ən·sē }

transmission-line impedance [ELEC] The complex ratio of the voltage across a transmission line to the current flowing in the line, where voltage and current are expressed in phasor notation. { tranz'mish·ən ¦līn imˌpēd·əns }

transmission-line parameters [ELEC] The quantities which are necessary to specify the impedance per unit length of a transmission line, and the admittance per unit length between various conductors of the line. Also known as linear electrical parameters; line parameters; transmission line constants. { tranz'mish·ən ¦līn pəˌram·əd·ərz }

transmission-line power [ELEC] The amount of energy carried past a point in a transmission line per unit time. { tranz'mish·ən ¦līn ˌpaù·ər }

transmission-line reflection coefficient [ELEC] The ratio of the voltage reflected from the load at the end of a transmission line to the direct voltage. { tranz'mish·ən ¦līn ri'flek·shən ˌkō·iˌfish·ənt }

transmission-line theory [ELEC] The application of electrical and electromagnetic theory to the behavior of transmission lines. { tranz 'mish·ən ¦līn ˌthē·ə·rē }

transmission-line transducer loss [ELEC] The ratio of the power delivered by a transmission line to a load to that produced at the generator, expressed in decibels; equal to the sum of the attenuation of the line and the mismatch loss. { tranz'mish·ən ¦līn trans'dü·sərˌlós }

transmission-line voltage [ELEC] The work that

would be required to transport a unit electrical charge between two specified conductors of a transmission line at a given instant. { tranz 'mish·ən ¦līn ˌvōl·tij }

transmission substation [ELEC] An electric power substation associated with high voltage levels. { tranz'mish·ən 'səbˌstā·shən }

transmission tower [ENG] A concrete, metal, or timber structure used to carry a transmission line. { tranz'mish·ən ˌtaù·ər }

transmissometer [ENG] An instrument for measuring the extinction coefficient of the atmosphere and for the determination of visual range. Also known as hazemeter; transmittance meter. { ˌtranz·məˈsäm·əd·ər }

transmittance meter *See* transmissometer. { tranz 'mid·əns ˌmēd·ər }

transmitter *See* synchro transmitter. { tranz'mid·ər }

transmitter noise *See* frying noise. { tranz'mid·ər ˌnóiz }

transobuoy [ENG] A free-floating or moored automatic weather station developed for the purpose of providing weather reports from the open oceans; it transmits barometric pressure, air temperature, sea-water temperature, and wind speed and direction. { 'tranˌsōˌbȯi }

transom [BUILD] A window above a door. { 'tran·səm }

transonic wind tunnel [ENG] A type of high-speed wind tunnel capable of testing the effects of airflow past an object at speeds near the speed of sound, Mach 0.7 to 1.4; sonic speed occurs where the cross section of the tunnel is at a minimum, that is, where the test object is located. { tranˈsän·ik 'wind ˌtən·əl }

transosonde [ENG] The flight of a constant-level balloon, whose trajectory is determined by tracking with radio-direction-finding equipment; thus, it is a form of upper-air, quasi-horizontal sounding. { 'tran·zəˌsänd }

transponder set [ELECTR] A complete electronic set which is designed to receive an interrogation signal, and which retransmits coded signals that can be interpreted by the interrogating station; it may also utilize the received signal for actuation of additional equipment such as local indicators or servo amplifiers. { tranz'pän·dər ˌset }

transport [ENG] Conveyance equipment such as vehicular transport, hydraulic transport, and conveyor-belt setups. { trans'pȯrt (verb), 'tranz ˌpȯrt (noun) }

transportation emergency [ENG] A situation which is created by a shortage of normal transportation capability and of a magnitude sufficient to frustrate movement requirements, and which requires extraordinary action by the designated authority to ensure continued movement. { ˌtranz·pərˈtā·shən iˌmər·jən·sē }

transportation engineering [ENG] That branch of engineering relating to the movement of goods and people; major types of transportation are highway, water, rail, subway, air, and pipeline. { ˌtranz·pərˈtā·shən ˌen·jəˌnir·iŋ }

transportation lag *See* distance/velocity lag. { ˌtranz·pərˈtā·shən ˌlag }

transportation priorities [ENG] Indicators assigned to eligible traffic which establish its movement precedence; appropriate priority systems apply to the movement of traffic by sea and air. { ˌtranz·pərˈtā·shən prīˌär·əd·ēz }

transportation problem [IND ENG] A programming problem that is concerned with the optimal pattern of the distribution of goods from several points of origin to several different destinations, with the specified requirements at each destination. { ˌtranz·pərˈtā·shən ˌpräb·ləm }

transport capacity [ENG] The number of persons or the tonnage (or volume) of equipment which can be carried by a vehicle under given conditions. { 'tranzˌpȯrt kəˌpas·əd·ē }

transport case [ENG] A moistureproof nonconductive wood, plastic, or fabric container used to transport safely small quantities of dynamite sticks to and from blasting sites. { 'tranzˌpȯrt ˌkās }

transporter crane [MECH ENG] A long lattice girder supported by two lattice towers which may be either fixed or moved along rails laid at right angles to the girder; a crab with a hoist suspended from it travels along the girder. { trans'pȯrd·ər ˌkrān }

transport lag *See* distance/velocity lag. { 'tranz ˌpȯrt ˌlag }

transport network [ENG] The complete system of the routes pertaining to all means of transport available in a particular area, made up of the network particular to each means of transport. { 'tranzˌpȯrt ˌnetˌwərk }

transport vehicle [MECH ENG] Vehicle primarily intended for personnel and cargo carrying. { 'tranzˌpȯrt ˌvē·ə·kəl }

transverse baffle *See* cross-flow baffle. { transˈvərs ¦baf·əl }

transverse magnetization [ENG ACOUS] Magnetization of a magnetic recording medium in a direction perpendicular to the line of travel and parallel to the greatest cross-sectional dimension. { transˈvərs ˌmag·nəd·əˈzā·shən }

transverse stability [ENG] The ability of a ship or aircraft to recover an upright position after waves or wind roll it to one side. { transˈvərs stə'bil·əd·ē }

transverse vibration [MECH] Vibration of a rod in which elements of the rod move at right angles to the axis of the rod. { transˈvərs vī'brā·shən }

trap [CIV ENG] A bend or dip in a soil drain which is always full of water, providing a water seal to prevent odors from entering the building. [ELECTR] **1.** A tuned circuit used in the radio-frequency or intermediate-frequency section of a receiver to reject undesired frequencies; traps in television receiver video circuits keep the sound signal out of the picture channel. Also known as rejector. **2.** *See* wave trap. [ENG] A sealed passage such as a U-shaped bend in a pipe or pump that prevents the return flow of liquid or gas. [MECH ENG] A device which reduces the effect of the vapor pressure of oil or

mercury on the high-vacuum side of a diffusion pump. { trap }

TRAPATT diode [ELECTR] A *pn* junction diode, similar to the IMPATT diode, but characterized by the formation of a trapped space-charge plasma within the junction region; used in the generation and amplification of microwave power. Derived from trapped plasma avalanche transit time diode. { 'tra,pat ,dī,ōd }

trapdoor [BUILD] **1.** A hinged, sliding, or lifting door to cover an opening in a roof, ceiling, or floor. **2.** An undocumented entry point into a computer program, which is generally inserted by a programmer to allow discreet access to the program. { 'trap,dȯr }

trapezoidal excavator [MECH ENG] A digging machine which removes earth in a trapezoidal cross-section pattern for canals and ditches. { ¦trap·ə¦zȯid·əl 'eks·kə,vād·ər }

trapped-air process [ENG] A procedure for the blow-mold forming of closed plastic objects; the bottom pinch is conventional and, after blowing, sliding pinchers close off the top to form a sealed-air, inflated product. { 'trapt ¦er 'prä·səs }

trapped fuel [ENG] The fuel in an engine or fuel system that is not in the fuel tanks. { 'trapt 'fyül }

trap seal [CIV ENG] The vertical distance between the crown weir and the top of the dip of the trap in a plumbing system. { 'trap ,sēl }

trash screen [CIV ENG] A screen placed in a waterway to prevent the passage of trash. { 'trash ,skrēn }

Trauzl test [ENG] A test to determine the relative disruptive power of explosives, in which a standard quantity of explosive (10 grams) is placed in a cavity in a lead block and exploded; the resulting volume of cavity in the block is compared with the volume produced under the same conditions by a standard explosive, usually trinitrotoluene (TNT). { 'traůt·səl ,test }

trave [BUILD] **1.** A division or bay (as in a ceiling) made by or appearing to be made by crossbeams. **2.** *See* crossbeam. { trāv }

travel [MECH ENG] The vertical distance of the path of an elevator or escalator as measured from the bottom terminal landing to the top terminal landing. { 'trav·əl }

travel chart [IND ENG] A tabulation of the various distances traveled by personnel or material between points in a manufacturing facility. { 'trav·əl ,chärt }

travel envelope [IND ENG] The clearance in space required by an automated guided vehicle when the vehicle is carrying a load with the maximum permissible dimensions. { ¦trav·əl ¦en·və,lōp }

traveling block [MECH ENG] The movable unit, consisting of sheaves, frame, clevis, and hook, connected to, and hoisted or lowered with, the load in a block-and-tackle system. Also known as floating block; running block. { 'trav·əl·iŋ 'bläk }

traveling detector [ENG] Radio-frequency probe which incorporates a detector used to measure the standing-wave ratio in a slotted-line section. { 'trav·əl·iŋ di'tek·tər }

traveling gantry crane [ENG] A type of hoisting machine with a bridgelike structure spanning the area over which it operates and running along tracks at ground level. { 'trav·əl·iŋ 'gan·trē ,krān }

traveling-grate stoker [MECH ENG] A type of furnace stoker; coal feeds by gravity into a hopper located on top of one end of a moving (traveling) grate; as the grate passes under the hopper, it carries a bed of fresh coal toward the furnace. { 'trav·əl·iŋ ¦grāt 'stō·kər }

traveling-screen dryer [CHEM ENG] A moving screen belt on which damp material is conveyed through a heated drying zone. Also known as screen dryer. { 'trav·əl·iŋ ¦skrēn 'drī·ər }

traveling-wave tube [ELECTR] An electron tube in which a stream of electrons interacts continuously or repeatedly with a guided electromagnetic wave moving substantially in synchronism with it, in such a way that there is a net transfer of energy from the stream to the wave; the tube is used as an amplifier or oscillator at frequencies in the microwave region. { 'trav·əl·iŋ ¦wāv ,tüb }

traverse [ENG] **1.** A survey consisting of a set of connecting lines of known length, meeting each other at measured angles. Also known as survey traverse. **2.** Movement to right or left on a pivot or mount, as of a gun, launcher, or radar antenna. { tra'vərs }

traverse adjustment *See* balancing a survey. { tra'vərs ə,jəs·mənt }

traversing mechanism [ENG] Mechanism by which a gun or other device can be turned in a horizontal plane. { trə'vərs·iŋ ,mek·ə,niz·əm }

trawl [ENG] A baglike net whose mouth is kept open by boards or by a leading diving vane or depressor at the foot of the opening and a spreader bar at the top; towed by a ship at specified depths for catching forms of marine life. { trȯl }

tray elevator [MECH ENG] A device for lifting drums, barrels, or boxes; a parallel pair of vertical-mounted continuous chains turn over upper and lower drive gears, and spaced trays on the chains cradle and lift the objects to be moved. { 'trā ,el·ə,vād·ər }

tray tower [CHEM ENG] A vertical process tower for liquid-vapor contacting (as in distillation, absorption, stripping, evaporation, spray drying, dehumidification, humidification, flashing, rectification, dephlegmation), along the height of which is a series of trays designed to cause intimate contact between the falling liquid and the rising vapor. { 'trā ,taů·ər }

tread [CIV ENG] **1.** The horizontal part of a step in a staircase. **2.** The distance between two successive risers in a staircase. [ENG] The part of a wheel or tire that bears on the road or rail. { tred }

treater [CHEM ENG] A vessel or system for the contacting of a process stream with reagent (treating) chemicals; for example, acid treating or caustic treating. { 'trēd·ər }

treating [CHEM ENG] Usually, the contacting of a fluid stream (for example, water, sewage, petroleum products, or mixed gases) with chemicals to improve the fluid properties by removing, sequestering, or converting undesirable impurities. { 'trēd·iŋ }

tremolo circuit [ENG ACOUS] A device which imparts a simple periodic amplitude modulation on the sound produced by an electronic instrument. { 'trem·ə·lō ˌsər·kət }

tremie [ENG] An apparatus for placing concrete underwater, consisting of a large metal tube with a hopper at the top end and a valve arrangement at the bottom, submerged end. { 'trem·ē }

trench duct [CIV ENG] A metal-lined trough set into a concrete floor with removable cover plates that are level with the top of the floor; used to house electrical connections. { 'trench ˌdəkt }

trencher *See* trench excavator. { 'trench·ər }

trench excavator [MECH ENG] A digging machine, usually on crawler tracks, and having either a movable wheel or a continuous chain on which buckets are mounted. Also known as bucket-ladder excavator; ditcher; trencher; trenching machine. { 'trench 'ek·skəˌvād·ər }

trenching machine *See* trench excavator. { 'trench·iŋ məˌshēn }

trench shield [CIV ENG] A movable shoring system consisting of steel plates and braces that are bolted or welded together; used to support the walls of a trench while work is in progress. { 'trench ˌshēld }

trennschaukel apparatus [ENG] An instrument for determining the thermal diffusion factors of gases and gas mixtures, consisting of 20 suitably interconnected tubes whose top ends are maintained at the same temperature and whose bottom ends are maintained at the same temperature, with the temperature of the top ends greater than that of the bottom ends. { 'tren ˌshaù·kəl ˌap·əˌrad·əs }

trepanning tool [MECH ENG] A cutting tool in the form of a circular tube, having teeth on the end; the workpiece or tube, or both, are rotated and the tube is fed axially into the workpiece, leaving behind a narrow grooved surface in the workpiece. { trə'pan·iŋ ˌtül }

Tresca criterion [MECH] The assumption that plastic deformation of a material begins when the difference between the maximum and minimum principal stresses equals twice the yield stress in shear. { 'tres·kə krīˌtir·ē·ən }

trestle [CIV ENG] A series of short bridge spans supported by a braced tower. [ENG] **1.** A movable support usually with legs that spread diagonally. **2.** A braced structure of timber, reinforced concrete, or steel spanning a land depression to carry a road or railroad. { 'tres·əl }

trestle bent [CIV ENG] A transverse frame that supports the ends of the stringers in adjoining spans of a trestle. { 'tres·əl ˌbent }

trial batch [ENG] A batch of concrete mixed to determine the water-cement ratio that will produce the required slump and compressive strength; from a trial batch, one can also compute the yield, cement factor, and required quantities of each material. { ˈtrīl 'bach }

trial shots [ENG] The experimental shots and rounds fired in a sinking pit, tunnel, opencast, or quarry to determine the best drill-hole pattern to use. { 'trīl ˌshäts }

triangle equation *See* angle equation. { 'trīˌaŋ·gəl iˌkwā·zhən }

triangle of forces [MECH] A triangle, two of whose sides represent forces acting on a particle, while the third represents the combined effect of these forces. { 'trīˌaŋ·gəl əv 'fȯr·səs }

triangular-notch weir [CIV ENG] A measuring weir with a V-shaped notch for measuring small flows. Also known as V-notch weir. { trī'aŋ·gyə·lər ˈnäch 'wer }

triangulation [ENG] A surveying method for measuring a large area of land by establishing a base line from which a network of triangles is built up; in a series, each triangle has at least one side common with each adjacent triangle. { trīˌaŋ·gyə'lā·shən }

triangulation mark [ENG] A bronze disk set in the ground to identify a point whose latitude and longitude have been determined by triangulation. { trīˌaŋ·gyə'lā·shən ˌmärk }

tribometer [ENG] A device for measuring coefficients of friction, consisting of a loaded sled subject to a measurable force. { trī'bäm·əd·ər }

trickle charge [ELEC] A continuous charge of a storage battery at a low rate to maintain the battery in a fully charged condition. { 'trik·əl ˌchärj }

trickle cooler *See* cascade cooler. { 'trik·əl ˌkü·lər }

trickle drain [CIV ENG] A drain that is set vertically in water, such as a pond, with its top open and level with the normal water surface in order to carry off excess water. { 'trik·əl ˌdrān }

trickle hydrodesulfurization [CHEM ENG] A fixed-bed, petroleum refining process for desulfurization of middle distillates and gas oils; catalyst is cobalt molybdenum on alumina. { 'trik·əl ˌhī·drō·dēˌsəl·fə·rə'zā·shən }

trickling filter [CIV ENG] A bed of broken rock or other coarse aggregate onto which sewage or industrial waste is sprayed intermittently and allowed to trickle through, leaving organic matter on the surface of the rocks, where it is oxidized and removed by biological growths. { 'trik·liŋ ˌfil·tər }

tricone bit [ENG] A rock bit with three toothed, conical cutters, each of which is mounted on friction-reducing bearings. { 'trīˌkōn 'bit }

trifilter hydrophotometer [ENG] An instrument that uses red, green, and blue filters to measure the transparency of the water at three wavelengths. { 'trīˌfil·tər ˌhī·drō·fə'täm·əd·ər }

trigger bolt *See* auxiliary dead latch. { 'trig·ər ˌbōlt }

trigger pull [MECH] Resistance offered by the trigger of a rifle or other weapon; force which must be exerted to pull the trigger. { 'trig·ər ˌpůl }

trigonometric leveling [ENG] A method of determining the difference of elevation between two points, by using the principles of triangulation and trigonometric calculations. { ˌtrig·ə·nəˈme·trik 'lev·əl·iŋ }

trilateration [ENG] The measurement of a series of distances between points on the surface of the earth, for the purpose of establishing relative positions of the points in surveying. { trīˌlad·əˈrā·shən }

trim [ELECTR] Fine adjustment of capacitance, inductance, or resistance of a component during manufacture or after installation in a circuit. { trim }

trimmer [BUILD] One of the single or double joists or rafters that go around an opening in the framing type of construction. { 'trim·ər }

trimmer conveyor [MECH ENG] A self-contained, lightweight portable conveyor, usually of the belt type, for use in unloading and delivering bulk materials from trucks to domestic storage places, and for trimming bulk materials in bins or piles. { 'tim·ər kənˌvā·ər }

triode transistor [ELECTR] A transistor that has three terminals. { 'trīˌōd tranˈzis·tər }

trip [ENG] To release a lever or set free a mechanism. { trip }

trip hammer [MECH ENG] A large power hammer whose head is tripped and falls by cam or lever action. { 'trip ˌham·ər }

triple thread [DES ENG] A multiple screw thread having three threads or starts equally spaced around the periphery; the lead is three times the pitch. { 'trip·əl 'thred }

triplex chain block [MECH ENG] A geared hoist using an epicyclic train. { 'tripˌleks 'chān ˌbläk }

tripod [DES ENG] An adjustable, collapsible three-legged support, as for a camera or surveying instrument. { 'trīˌpäd }

tripodal grasp [IND ENG] A basic grasp whereby an object is held by the thumb, index finger, and middle finger, to provide delicate rotational control. Also known as manipulative grasp. { ˌtrīˌpōd·əl 'grasp }

tripod drill [MECH ENG] A reciprocating rock drill mounted on three legs and driven by steam or compressed air; the drill steel is removed and a longer drill inserted about every 2 feet (61 centimeters). { 'trīˌpäd ˌdril }

tripper [CIV ENG] A device activated by a passing train to work a signal or switch or to apply brakes. [MECH ENG] A device that snubs a conveyor belt causing the load to be discharged. { 'trip·ər }

trip spear [ENG] A fishing tool intended to recover lost casing; if the casing is found to be immovable, the hold is broken by operating the trip release. { 'trip ˌspir }

trisistor [ELECTR] Fast-switching semiconductor consisting of an alloyed junction *pnp* device in which the collector is capable of electron injection into the base; characteristics resemble those of a thyratron electron tube, and switching time is in the nanosecond range. { triˈzis·tər }

tristate logic [ELECTR] A form of transistor-transistor logic in which the output stages or input and output stages can assume three states; two are the normal low-impedance 1 and 0 states, and the third is a high-impedance state that allows many tristate devices to time-share bus lines. { 'trīˌstāt 'läj·ik }

trolley [MECH ENG] **1.** A wheeled car running on an overhead track, rail, or ropeway. **2.** An electric streetcar. { 'träl·ē }

trolley locomotive [MECH ENG] A locomotive operated by electricity drawn from overhead conductors by means of a trolley pole. { 'träl·ēˌlōk·əˈmōd·iv }

tropical finish [ENG] A finish that is applied to electronic equipment to resist the high relative humidity, fungus, and insects encountered in tropical climates. { 'träp·ə·kəl 'fin·ish }

tropicalize [ENG] To prepare electronic equipment for use in a tropical climate by applying a coating that resists moisture and fungi. { 'träp·ə·kəˌlīz }

tropometer [ENG] An instrument for measuring the angle through which one end of a bar is twisted in determining the strength of a material in torsion. { trəˈpäm·əd·ər }

troughed belt conveyor [MECH ENG] A belt conveyor with the conveyor belt edges elevated on the carrying run to form a trough by conforming to the shape of the troughed carrying idlers or other supporting surface. { 'trȯft 'belt kənˌvā·ər }

troughed roller conveyor [MECH ENG] A roller conveyor having two rows of rolls set at an angle to form a trough over which objects are conveyed. { 'trȯft 'rō·lər kənˌvā·ər }

troughing idler [MECH ENG] A belt idler having two or more rolls arranged to turn up the edges of the belt so as to form the belt into a trough. { 'trȯf·iŋ ˌīd·lər }

troughing rolls [MECH ENG] The rolls of a troughing idler that are so mounted on an incline as to elevate each edge of the belt into a trough. { 'trȯf·iŋ ˌrōlz }

Trouton's rule [THERMO] The rule that, for a nonassociated liquid, the latent heat of vaporization in calories is equal to approximately 22 times the normal boiling point on the Kelvin scale. { 'traůt·ənz ˌrül }

trowel [DES ENG] Any of various hand tools consisting of a wide, flat or curved blade with a short wooden handle; used by gardeners, plasterers, and bricklayers. { 'traůl }

troweling machine [MECH ENG] A motorized device used to spread concrete by operating orbiting steel trowels on radial arms rotated on a vertical shaft. { 'träwl·iŋ məˌshēn }

troy ounce *See* ounce. { 'trȯi 'aůns }

troy pound *See* pound. { 'trȯi 'paůnd }

troy system [MECH] A system of mass units used primarily to measure gold and silver; the

ounce is the same as that in the apothecaries' system, being equal to 480 grains or 31.1034768 grams. Abbreviated t. Also known as troy weight. { 'trȯi ˌsis·təm }

troy weight *See* troy system. { 'trȯi ˌwāt }

truck [MECH ENG] A self-propelled wheeled vehicle, designed primarily to transport goods and heavy equipment; it may be used to tow trailers or other mobile equipment. { trək }

truck crane [MECH ENG] A crane carried on the bed of a motortruck. { 'trək ˌkrān }

truck-mounted drill rig [MECH ENG] A drilling rig mounted on a lorry or caterpillar tracks. { 'trək ˌmaünt·əd 'dril ˌrig }

truck-tractor *See* tractor. { 'trək ˌtrak·tər }

true-boiling-point analysis [CHEM ENG] A standard laboratory technique used to predict the refining qualities of crude petroleum; gives distillation cuts for gasoline, kerosine, distillate (diesel) fuel, cracking, and lube distillate stocks. Also known as true-boiling-point distillation. { 'trü 'bȯil·iŋ ˌpȯint əˌnal·ə·səs }

true-boiling-point distillation *See* true-boiling-point analysis. { 'trü 'bȯil·iŋ ˌpȯint ˌdis·təˌlā·shən }

true rake [MECH ENG] The angle, measured in degrees, between a plane containing a tooth face and the axial plane through the tooth point in the direction of chip flow. { 'trü 'rāk }

truing [MECH ENG] **1.** Cutting a grinding wheel to make its surface run concentric with the axis. **2.** Aligning a wheel to be concentric and in one plane. { 'trü·iŋ }

truncate [CONT SYS] To stop a robotic process before it has been completed. { 'trəŋˌkāt }

truncated icosahedral gravitational-wave antenna [ENG] A resonant-mass antenna for detecting gravitational radiation in which the shape of the mass is a truncated icosahedron, which is much more efficient for this purpose than a cylinder. Abbreviated TIGA. { ˌtrəŋˌkād·əd ˌīˌkäs·əˌhē·drəl ˌgrav·əˌtā·shən·əl 'wāv anˌten·ə }

truncation error [ENG] The error resulting from the analysis of a partial set of data in place of a complete or infinite set. { trəŋ'kā·shən ˌer·ər }

trunk buoy [ENG] A mooring buoy having a pendant extending through an opening in the buoy, with the ship's anchor chain or mooring line being secured to this pendant. { 'trəŋk ˌbȯi }

trunk sewer [CIV ENG] A sewer receiving sewage from many tributaries serving a large territory. { 'trəŋk ˌsü·ər }

trunnion [DES ENG] **1.** Either of two opposite pivots, journals, or gudgeons, usually cylindrical and horizontal, projecting one from each side of a piece of ordnance, the cylinder of an oscillating engine, a molding flask, or a converter, and supported by bearings to provide a means of swiveling or turning. **2.** A pin or pivot usually mounted on bearings for rotating or tilting something. [ENG] A tubular section of steel welded to the side of a pipe in order to help support the pipe. { 'trən·yən }

truss [CIV ENG] A frame, generally of steel, timber, concrete, or a light alloy, built from members in tension and compression. { trəs }

truss bridge [CIV ENG] A fixed bridge consisting of members vertically arranged in a triangular pattern. { 'trəs ˌbrij }

trussed beam [CIV ENG] A beam stiffened by a steel tie rod to reduce its deflection. { 'trəst 'bēm }

trussed rafter [BUILD] A triangulated beam in a trussed roof. { 'trəst 'raf·tər }

truss rod [CIV ENG] A rod attached to the ends of a trussed beam which transmits the strain due to downward pressure. { 'trəs ˌräd }

try square [ENG] An instrument consisting of two straightedges secured at right angles to each other, used for laying off right angles and testing whether work is square. { 'trī ˌskwer }

Tschudi engine [MECH ENG] A cat-and-mouse engine in which the pistons, which are sections of a torus, travel around a toroidal cylinder; motion of the pistons is controlled by two cams which bear against rollers attached to the rotors. { 'chü·dē ˌen·jən }

tsi [MECH] A unit of force equal to 1 ton-force per square inch; equal to approximately 1.54444 $\times 10^7$ pascals. { sī *or* ˌtēˌesˈī }

T slot [DES ENG] A recessed slot, in the form of an inverted T, in the table of a machine tool, to receive the square head of a T-slot bolt. { 'tē ˌslät }

tsp *See* teaspoonful.

tspn *See* teaspoonful.

TTL *See* transistor-transistor logic.

tube [ELECTR] *See* electron tube. [ENG] **1.** A long cylindrical body with a hollow center used especially to convey fluid. **2.** *See* inner tube. { 'tüb }

tube bank [MECH ENG] An array of tubes designed to be used as a heat exchanger. { 'tüb ˌbaŋk }

tube bundle [ENG] In a shell-and-tube heat exchanger, an assembly of parallel tubes that is tied together with tie rods. { 'tüb ˌbən·dəl }

tube cleaner [MECH ENG] A device equipped with cutters or brushes used to clean tubes in heat transfer equipment. { 'tüb ˌklēn·ər }

tube door [MECH ENG] A door in a boiler furnace wall which facilitates the removal or installation of tubes. { 'tüb ˌdȯr }

tube hole [ENG] A hole in a tube sheet through which a tube is passed prior to sealing. { 'tüb ˌhōl }

tubeless tire [ENG] A tire that does not require an inner tube to hold air. { ˈtüb·ləs 'tīr }

tube mill [MECH ENG] A revolving cylinder used for fine pulverization of ore, rock, and other such materials; the material, mixed with water, is fed into the chamber from one end, and passes out the other end as slime. { 'tüb ˌmil }

tube plug [ENG] A solid plug inserted into the end of a tube in a tube sheet. { 'tüb ˌpləg }

tube seat [ENG] The surface of the tube hole in a tube sheet which contacts the tube. { 'tüb ˌsēt }

tube sheet [ENG] A mounting plate for elements of a larger item of equipment; for example, filter cartridges, or tubes for heat exchangers, coolers, or boilers. { 'tüb ˌshēt }

tube shield [ENG] A shield designed to be placed around an electron tube. { 'tüb ˌshēld }

tube socket [ENG] A socket designed to accommodate electrically and mechanically the terminals of an electron tube. { 'tüb ˌsäk·ət }

tube-still heater [CHEM ENG] A firebox containing a pipe coil through which oil for a tube still (pipe still) is pumped. { 'tüb ¦stil ˌhēd·ər }

tube turbining [MECH ENG] Cleaning tubes by passing a power-driven rotary device through them. { 'tüb ˌtər·bən·iŋ }

tube voltmeter *See* vacuum-tube voltmeter. { 'tüb 'vōltˌmēd·ər }

tubing [ENG] Material in the form of a tube, most often seamless. { 'tüb·iŋ }

tubular exchanger *See* shell-and-tube exchanger. { 'tü·byə·lər iks'chānj·ər }

tuck-and-pat pointing *See* tuck pointing. { ¦tək ən ¦pat ˌpȯint·iŋ }

tuck joint pointing *See* tuck pointing. { 'tək ˌjȯint ˌpȯint·iŋ }

tuck pointing [BUILD] The finishing of old masonry joints in which the joints are first cleaned out and then filled with fine mortar which projects slightly or has a fillet of putty or lime. Also known as tuck-and-pat pointing; tuck joint pointing. { 'tək ˌpȯint·iŋ }

Tukon tester [ENG] A device that uses a diamond (Knoop) indenter applying average loads of 1 to 2000 grams to determine microhardness of a metal. { 'tüˌkän ˌtes·tər }

tumble *See* topple. { 'təm·bəl }

tumble axis *See* topple axis. { 'təm·bəl ˌak·səs }

tumbler [ENG] **1.** A device in a lock cylinder that must be moved to a particular position, as by a key, before the bolt can be thrown. **2.** A device or mechanism in which objects are tumbled. { 'təm·blər }

tumbler feeder *See* drum feeder. { 'təm·blər ˌfēd·ər }

tumbler gears [MECH ENG] Idler gears interposed between spindle and stud gears in a lathe gear train; used to reverse rotation of lead screw or feed rod. { 'təm·blər ˌgirz }

tumbling [ENG] A surface-finishing operation for small articles in which irregularities are removed or surfaces are polished by tumbling them together in a barrel, along with wooden pegs, sawdust, and polishing compounds. [MECH ENG] Loss of control in a two-frame free gyroscope, occurring when both frames of reference become coplanar. { 'təm·bliŋ }

tumbling mill [MECH ENG] A grinding and pulverizing machine consisting of a shell or drum rotating on a horizontal axis. { 'təm·bliŋ ˌmil }

tune [ELECTR] To adjust for resonance at a desired frequency. { tün }

tuned amplifier [ELECTR] An amplifier in which the load is a tuned circuit; load impedance and amplifier gain then vary with frequency. { ¦tünd 'am·pləˌfī·ər }

tuned-anode oscillator [ELECTR] A vacuum-tube oscillator whose frequency is determined by a tank circuit in the anode circuit, coupled to the grid to provide the required feedback. Also known as tuned-plate oscillator. { ¦tünd 'anˌōd ˌäs·əˌlād·ər }

tuned circuit [ELECTR] A circuit whose components can be adjusted to make the circuit responsive to a particular frequency in a tuning range. Also known as tuning circuit. { ¦tünd 'sər·kət }

tuned filter [ELECTR] Filter that uses one or more tuned circuits to attenuate or pass signals at the resonant frequency. { ¦tünd 'fil·tər }

tuned-reed frequency meter *See* vibrating-reed frequency meter. { ¦tünd 'rēd 'frē·kwən·sē ˌmēd·ər }

tuner [ELECTR] The portion of a receiver that contains circuits which can be tuned to accept the carrier frequency of the alternating current supplied to the primary, thereby causing the secondary voltage to build up to higher values than would otherwise be obtained. { 'tü·nər }

tuning fork [ENG] A U-shaped bar for hard steel, fused quartz, or other elastic material that vibrates at a definite natural frequency when struck or when set in motion by electromagnetic means; used as a frequency standard. { 'tün·iŋ ˌfȯrk }

tunnel [ENG] A long, narrow, horizontal or nearly horizontal underground passage that is open to the atmosphere at both ends; used for aqueducts and sewers, carrying railroad and vehicular traffic, various underground installations, and mining. { 'tən·əl }

tunnel blasting [ENG] A method of heavy blasting in which a heading is driven into the rock and afterward filled with explosives in large quantities, similar to a borehole, on a large scale, except that the heading is usually divided in two parts on the same level at right angles to the first heading, forming in plan a T, the ends of which are filled with explosives and the intermediate parts filled with inert material like an ordinary borehole. { 'tən·əl ˌblast·iŋ }

tunnel borer [MECH ENG] Any boring machine for making a tunnel; often a ram armed with cutting faces operated by compressed air. { 'tən·əl ˌbȯr·ər }

tunnel carriage [MECH ENG] A machine used for rapid tunneling, consisting of a combined drill carriage and manifold for water and air so that immediately the carriage is at the face, drilling may commence with no lost time for connecting up or waiting for drill steels; the air is supplied at pressures of 95 to 100 pounds per square inch (655,000 to 689,000 pascals). { 'tən·əl ˌkar·ij }

tunnel diode [ELECTR] A heavily doped junction diode that has a negative resistance at very low voltage in the forward bias direction, due to quantum-mechanical tunneling, and a short circuit in the negative bias direction. Also known as Esaki tunnel diode. { 'tən·əl ˌdīˌōd }

tunnel junction [ELECTR] A two-terminal electronic device having an extremely thin potential barrier to electron flow, so that the transport

characteristic (the current-voltage curve) is primarily governed by the quantum-mechanical tunneling process which permits electrons to penetrate the barrier. { 'tən·əl ˌjəŋk·shən }

tunnel liner [CIV ENG] Any of various materials, especially timber, concrete, and cast iron, applied to the inner surface of a vehicular or railroad tunnel. { 'tən·əl ˌlīn·ər }

tunnel resistor [ELECTR] Resistor in which a thin layer of metal is plated across a tunneling junction, to give the combined characteristics of a tunnel diode and an ordinary resistor. { 'tən·əl ri,zis·tər }

tunnel triode [ELECTR] Transistorlike device in which the emitter-base junction is a tunnel diode and the collector-base junction is a conventional diode. { 'tən·əl ˌtrī,ōd }

turbine [MECH ENG] A fluid acceleration machine for generating rotary mechanical power from the energy in a stream of fluid. { 'tər·bən }

turbine propulsion [MECH ENG] Propulsion of a vehicle or vessel by means of a steam or gas turbine. { 'tər·bən prə,pəl·shən }

turbine pump *See* regenerative pump. { 'tər·bən ˌpəmp }

turbining [MECH ENG] The removal of scale or other foreign material from the internal surface of a metallic cylinder. { 'tər·bən·iŋ }

turboblower [MECH ENG] A centrifugal or axial-flow compressor. { 'tər·bō,blō·ər }

turbogrid plate [CHEM ENG] A tray for distillation columns that consists of a flat grid of parallel slots extending over the entire cross-sectional area of the column; the liquid level on each tray is maintained by a dynamic balance between down-flowing liquid and up-flowing vapor. { 'tər·bō,grid 'plāt }

turbopump [MECH ENG] A pump that is powered by a turbine. { 'tər·bō,pəmp }

turboshaft [MECH ENG] A gas turbine engine that is similar to a turboprop but operates through a transmission system to power a device such as a helicopter rotor or pump. { 'tər·bō,shaft }

turbosupercharger [MECH ENG] A centrifugal air compressor, gas-turbine driven, usually used to increase induction system pressure in an internal combustion reciprocating engine. { ˌtər·bō'sü·pər,chär·jər }

turbulent burner [ENG] An atomizing burner which mixes fuel and air to produce agitated flow. { 'tər·byə·lənt 'bər·nər }

turbulization [ENG] In a heat-transfer process involving the interaction of a solid, heat-conducting, and impermeable surface with a surrounding fluid, destruction of the boundary layer in order to intensify the convective heat transfer. { ˌtər·bə·lə'zā·shən }

turn [ELEC] One complete loop of wire. { 'tərn }

turnaround [CHEM ENG] In petroleum refining, the shutdown of a unit after a normal run for maintenance and repair work, then putting the unit back into operation. [ENG] The length of time between arriving at a point and departing from that point; it is used in this sense for the turnaround of vehicles, ships in ports, and aircraft. { 'tərn·ə,raund }

turnaround cycle [ENG] A term used in conjunction with vehicles, ships, and aircraft, and comprising the following: loading time at home, time to and from destination, unloading and loading time at destination, unloading time at home, planned maintenance time, and, where applicable, time awaiting facilities. { 'tərn·ə,raund ˌsī·kəl }

turnbuckle [DES ENG] A sleeve with a thread at one end and a swivel at the other, or with threads of opposite hands at each end so that by turning the sleeve connected rods or wire rope will be drawn together and tightened. { 'tərn,bək·əl }

turning [MECH ENG] Shaping a member on a lathe. { 'tərn·iŋ }

turning bar *See* chimney bar. { 'tərn·iŋ ˌbär }

turning basin [CIV ENG] An open area at the end of a canal or narrow waterway to allow boats to turn around. { 'tərn·iŋ ˌbās·ən }

turning-block linkage [MECH ENG] A variation of the sliding-block mechanical linkage in which the short link is fixed and the frame is free to rotate. Also known as the Wentworth quick-return motion. { 'tərn·iŋ ˌbläk ˌliŋ·kij }

turning center [MECH ENG] A numerically controlled lathe that sometimes functions together with a robot in boring and other machining work. { 'tərn·iŋ ˌsen·tər }

turning table [ENG] In plastics molding, a rotating table or wheel carrying various molds in a multimold, single-parison blow-molding operation. { 'tərn·iŋ ˌtā·bəl }

turnkey contract [ENG] A contract in which an independent agent undertakes to furnish for a fixed price all materials and labor, and to do all the work needed to complete a project. { 'tərn,kē 'kän,trakt }

turnout [ENG] **1.** A contrivance consisting of a switch, a frog, and two guardrails for passing from one track to another. **2.** The branching off of one rail track from another. **3.** A siding. { 'tərn,aůt }

turnover cartridge [ENG ACOUS] A phonograph pickup having two styli and a pivoted mounting that places in playing position the correct stylus for a particular record speed. { 'tərn,ō·vər ˌkär·trij }

turnover frequency *See* transition frequency. { 'tərn,ō·vər ˌfrē·kwən·sē }

turnover number [CHEM ENG] In an industrial catalytic process, a value that indicates the amount of feed or substrate converted per a measured amount of catalyst. { 'tərn·ō·vər ˌnəm·bər }

turnover rate [CHEM ENG] In an industrial catalytic process, a value corresponding to the turnover number per specified unit of time. { 'tərn,ō·vər ˌrāt }

turnpike [CIV ENG] A toll expressway. { 'tərn ˌpīk }

turns ratio [ELEC] The ratio of the number of turns in a secondary winding of a transformer

to the number of turns in the primary winding. { 'tərnz ˌrā·shō }

turnstile [ENG] A barrier that rotates about a vertical axis and usually is arranged to allow the passage of only one person at a time through an opening. { 'tərnˌstīl }

turntable [ENG ACOUS] The rotating platform on which a disk record is placed for recording or playback. { 'tərnˌtā·bəl }

turntable rumble [ENG ACOUS] Low-frequency vibration that is mechanically transmitted to a recording or reproducing turntable and superimposed on the reproduction. Also known as rumble. { 'tərnˌtā·bəl ˌrəm·bəl }

turret lathe [MECH ENG] A semiautomatic lathe differing from the engine lathe in having the tailstock replaced with a multisided, indexing tool holder or turret designed to hold several tools. { 'tə·rət ˌlāth }

turret robot [CONT SYS] A tower-shaped robot whose manipulator makes circular motions about the robot's base. { 'tər·ət 'rōˌbät }

Twaddell scale [ENG] A scale for specific gravity of solutions that is the first two digits to the right of the decimal point multiplied by two; for example, a specific gravity of 1.4202 is equal to 84.04°Tw. { twə'del ˌskāl }

tweeter [ENG ACOUS] A loudspeaker designed to handle only the higher audio frequencies, usually those well above 3000 hertz; generally used in conjunction with a crossover network and a woofer. { 'twēd·ər }

twin-cable ropeway [MECH ENG] An aerial ropeway which has parallel track cables with carriers running in opposite directions; both rows of carriers are pulled by the same traction rope. { 'twin ˌkāb·əl 'rōpˌwā }

twin-geared press [MECH ENG] A crank press having the drive gears attached to both ends of the crankshaft. { 'twin ˌgird 'pres }

twist [DES ENG] In a fiber, rope, yarn, or cord, the turns about its axis per unit length; usually expressed as TPI (turns per inch). { twist }

twist drill [DES ENG] A tool having one or more helical grooves, extending from the point to the smooth part of the shank, for ejecting cuttings and admitting a coolant. { 'twist ˌdril }

two-body problem [MECH] The problem of predicting the motions of two objects obeying Newton's laws of motion and exerting forces on each other according to some specified law such as Newton's law of gravitation, given their masses and their positions and velocities at some initial time. { 'tü ˌbäd·ē 'präb·ləm }

two-cycle engine [MECH ENG] A reciprocating internal combustion engine that requires two piston strokes or one revolution to complete a cycle. { 'tü ˌsī·kəl 'en·jən }

two-degrees-of-freedom gyro [MECH] A gyro whose spin axis is free to rotate about two orthogonal axes, not counting the spin axis. { 'tü ˌdiˌgrēz əv ˌfrē·dəm 'jī·rō }

two-level mold [ENG] Placement of one cavity of a plastics mold above another instead of alongside it; reduces clamping force needed. { 'tü ˌlev·əl 'mōld }

two-lip end mill [MECH ENG] An end-milling cutter having two cutting edges and straight or helical flutes. { 'tü ˌlip 'end ˌmil }

two-phase alternating-current circuit [ELEC] A circuit in which there are two alternating currents on separate wires, the two currents being 90° out of phase. { 'tü ˌfāz 'ȯl·tərˌnād·iŋ kə·rənt ˌsər·kət }

two-phase current [ELEC] Current delivered through two pairs of wires or at a phase difference of one-quarter cycle (90°) between the current in the two pairs. { 'tü ˌfāz 'kə·rənt }

two-point press [MECH ENG] A mechanical press in which the slide is actuated at two points. { 'tü ˌpȯint 'pres }

two-port system [CONT SYS] A system which has only one input or excitation and only one response or output. { 'tü ˌpȯrt 'sis·təm }

two-sided sampling plans [IND ENG] Any sampling plan whereby the acceptability of material is determined against upper and lower limits. { 'tü ˌsīd·əd 'sam·pliŋ ˌplanz }

two-step grooving system [ENG] A method of spooling a drum in which the wire rope, controlled by grooves, moves parallel to the drum flanges for one-half the circumference and then crosses over to start the next wrap. Also known as counterbalance system. { 'tü ˌstep 'grüv·iŋ ˌsis·təm }

two-stroke cycle [MECH ENG] An internal combustion engine cycle completed in two strokes of the piston. { 'tü ˌstrōk 'sī·kəl }

two-tone diaphone [ENG ACOUS] A diaphone producing blasts of two tones, the second tone being of a lower pitch than the first tone. { 'tü ˌtōn 'dī·əˌfōn }

two-way slab [CIV ENG] A concrete slab supported by beams along all four edges and reinforced with steel bars arranged perpendicularly. { 'tü ˌwā 'slab }

two-way valve [MECH ENG] A mechanical device that controls the flow of fluid by allowing flow in either of two directions. { 'tü ˌwā 'valv }

two-wire circuit [ELEC] A metallic circuit formed by two conductors insulated from each other; in contrast with a four-wire circuit, it uses only one line or channel for transmission of electric waves in both directions. { 'tü ˌwīr 'sər·kət }

tyfon *See* typhon. { 'tīˌfän }

Tyler screen [CHEM ENG] A screen standard for the openings in screen-type mediums based on meshes per linear inch; convertible to the U.S. Sieve Series. { 'tī·lər ˌskrēn }

Tyler Standard screen scale [ENG] A scale for classifying particles in which the particle size in micrometers is correlated with the meshes per inch of a screen. { 'ti·lər 'stan·dərd 'skrēn ˌskāl }

Tyndallization [ENG] Heat sterilization by steaming the food or medium for a few minutes at atmospheric pressure on three or four successive occasions, separated by 12- to 18-hour intervals of incubation at a temperature favorable for bacterial growth. { ˌtind·əl·əˈzā·shən }

type I assembly [ELECTR] An assembly consisting entirely of surface-mounted electronic components, on either one or both sides of a printed board. { ˈtīp ˈwən əˈsem·blē }

type II assembly [ELECTR] An assembly of both surface-mounted and leaded electronic components, in which the surface-mounted components are on both sides of the printed board. { ˈtīp ˈtü əˈsem·blē }

type III assembly [ELECTR] An assembly of both surface-mounted and leaded electronic components, in which the surface-mounted components are only on the bottom side of the printed board. { ˈtīp ˈthrē əˈsem·blē }

typhon [ENG ACOUS] A diaphragm horn which operates under the influence of compressed air or steam. Also spelled tyfon. { ˈtīˌfän }

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U

U-bend die [MECH ENG] A die with a square or rectangular cross section which provides two edges over which metal can be drawn. { 'yü ˌbend ˌdī }

U blades [DES ENG] Curved bulldozer blades designed to increase moving capacity of tractor equipment. { 'yü ˌblādz }

U bolt [DES ENG] A U-shaped bolt with threads at the ends of both arms to receive nuts. { 'yü ˌbōlt }

udometer *See* rain gage. { yü'däm·əd·ər }

UJT *See* unijunction transistor.

ullage [ENG] The amount that a container, such as a fuel tank, lacks of being full. { 'əl·ij }

ultimate bearing capacity [CIV ENG] The average load per unit area that will cause failure by rupture of a supporting soil mass. { ¦əl·tə·mət 'ber·iŋ kəˌpas·əd·ē }

ultimate load *See* breaking load. { 'əl·tə·mət ˌlōd }

ultimate-load design [DES ENG] Design of a beam that is proportioned to carry at ultimate capacity the design load multiplied by a safety factor. Also known as limit-load design; plastic design; ultimate-strength design. { ¦əl·tə·mət ¦lōd diˌzīn }

ultimate set [ENG] The ratio of the length of a specimen plate or bar before testing to the length at the moment of fracture; usually expressed as a percentage. { 'əl·tə·mət 'set }

ultimate strength [MECH] The tensile stress, per unit of the original surface area, at which a body will fracture, or continue to deform under a decreasing load. { 'əl·tə·mət 'streŋkth }

ultimate-strength design *See* ultimate-load design. { ¦əl·tə·mət ¦streŋkth diˌzīn }

ultracentrifuge [ENG] A laboratory instrument which develops centrifugal fields of more than 100,000 times gravity, used for the quantitative measurement of sedimentation velocity or sedimentation equilibrium, or for the separation of solutes in liquid solutions to study high polymers, particularly proteins, nucleic acids, viruses, and other macromolecules of biological origin. { ˌəl·trə'sen·trəˌfyüj }

ultrafiltration [CHEM ENG] Separation of colloidal or very fine solid materials by filtration through microporous or semipermeable mediums. { ¦əl·trə·fil'trā·shən }

ultramicrobalance [ENG] A differential weighing device with accuracies better than 1 microgram; used for analytical weighings in microanalysis. { ¦əl·trə'mī·krōˌbal·əns }

ultramicrotome [ENG] A microtome which uses a glass or diamond knife, allowing sections of cells to be cut 300 nanometers in thickness. { ¦əl·trə'mī·krəˌtōm }

ultrasonic atomizer [MECH ENG] An atomizer in which liquid is fed to, or caused to flow over, a surface which vibrates at an ultrasonic frequency; uniform drops may be produced at low feed rates. { ¦əl·trə'sän·ik 'adˌəˌmīz·ər }

ultrasonic cleaning [ENG] A method used to clean debris and swarf from surfaces by immersion in a solvent in which ultrasonic vibrations are excited. { ¦əl·trə'sän·ik 'klēn·iŋ }

ultrasonic delay line [ENG ACOUS] A delay line in which use is made of the propagation time of sound through a medium such as fused quartz, barium titanate, or mercury to obtain a time delay of a signal. Also known as ultrasonic storage cell. { ¦əl·trəˈsän·ik di'lā ˌlīn }

ultrasonic depth finder [ENG] A direct-reading instrument which employs frequencies above the audible range to determine the depth of water; it measures the time interval between the emission of an ultrasonic signal and the return of its echo from the bottom. { ¦əl·trəˈsän·ik 'depth ˌfīn·dər }

ultrasonic drill [MECH ENG] A drill in which a magnetostrictive transducer is attached to a tapered cone serving as a velocity transformer; with an appropriate tool at the end of the transformer, practically any shape of hole can be drilled in hard, brittle materials such as tungsten carbide and gems. { ¦əl·trəˈsän·ik 'dril }

ultrasonic drilling [MECH ENG] A vibration drilling method in which ultrasonic vibrations are generated by the compression and extension of a core of electrostrictive or magnetostrictive material in a rapidly alternating electric or magnetic field. { ¦əl·trəˈsän·ik 'dril·iŋ }

ultrasonic flaw detector [ENG ACOUS] An ultrasonic generator and detector used together, much as in radar, to determine the distance to a wave-reflecting internal crack or other flaw in a solid object. { ¦əl·trəˈsän·ik 'flȯ diˌtek·tər }

ultrasonic generator [ENG ACOUS] A generator

consisting of an oscillator driving an electroacoustic transducer, used to produce acoustic waves above about 20 kilohertz. { ˌəl·trəˈsän·ik ˈjen·əˌrād·ər }

ultrasonic imaging device [ENG ACOUS] An imaging device in which a wave is generated by a transducer external to the body; the reflected wave is detected by the same transducer. { ˌəl·trəˈsän·ik ˈim·ij·iŋ diˌvīs }

ultrasonic inspectoscope [ENG ACOUS] An instrument that transmits sound waves, at frequencies between 500 kilohertz and 15 megahertz, into a metal casting or other solid piece and determines the presence of flaws by reflections or by an interruption of the sound-wave transmission through the piece. { ˌəl·trəˌsän·ik inˈspek·təˌskōp }

ultrasonic leak detector [ENG] An instrument which detects ultrasonic energy resulting from the transition from laminar to turbulent flow of a gas passing through an orifice. { ˌəl·trəˈsän·ik ˈlēk diˌtek·tər }

ultrasonic machining [MECH ENG] The removal of material by abrasive bombardment and crushing in which a flat-ended tool of soft alloy steel is made to vibrate at a frequency of about 20,000 hertz and an amplitude of 0.001–0.003 inch (0.0254–0.0762 millimeter) while a fine abrasive of silicon carbide, aluminum oxide, or boron carbide is carried by a liquid between tool and work. { ˌəl·trəˈsän·ik məˈshēn·iŋ }

ultrasonic sealing [ENG] A method for sealing plastic film by using localized heat developed by vibratory mechanical pressure at ultrasonic frequencies. { ˌəl·trəˈsän·ik ˈsēl·iŋ }

ultrasonic storage cell *See* ultrasonic delay line. { ˌəl·trəˈsän·ik ˈstȯr·ij ˌsel }

ultrasonic testing [ENG] A nondestructive test method that employs high-frequency mechanical vibration energy to detect and locate structural discontinuities or differences and to measure thickness of a variety of materials. { ˌəl·trəˈsän·ik ˈtest·iŋ }

ultrasonic thickness gage [ENG] A thickness gage in which the time of travel of an ultrasonic beam through a sheet of material is used as a measure of the thickness of the material. { ˌəl·trəˈsän·ik ˈthik·nəs ˌgāj }

ultrasonic transducer [ENG ACOUS] A transducer that converts alternating-current energy above 20 kilohertz to mechanical vibrations of the same frequency; it is generally either magnetostrictive or piezoelectric. { ˌəl·trəˈsän·ik tranz ˈdü·sər }

ultrasonic transmitter [ENG ACOUS] A device used to track seals, fish, and other aquatic animals: the device is fastened to the outside of the animal or fed to it, and has a loudspeaker which is made to vibrate at an ultrasonic frequency, propagating ultrasonic waves through the water to a special microphone or hydrophone. { ˌəl·trəˈsän·ik tranzˈmid·ər }

ultrasonoscope [ENG] An instrument that displays an echosonogram on an oscilloscope; usually has auxiliary output to a chart-recording instrument. { ˌəl·trəˈsän·əˌskōp }

umbrella roof *See* station roof. { əmˈbrel·ə ˌrüf }

unavailable energy [THERMO] That part of the energy which, when an irreversible process takes place, is initially in a form completely available for work and is converted to a form completely unavailable for work. { ˌən·əˈvāl·ə·bəl ˈen·ər·jē }

unavoidable delay [IND ENG] Any delay in a task, the occurrence of which is outside the control or responsibility of the worker. { ˌən·əˈvȯid·ə·bəl diˈlā }

unavoidable-delay allowance [IND ENG] An adjustment of standard time to allow for unavoidable delays in a task. { ˌən·əˈvȯid·ə·bəl diˈlā əˌlaü·ənс }

unbonded member [CIV ENG] A posttensioned member that is made of prestressed concrete and has the tensioning force applied only against the end anchorages. { ənˈbänd·əd ˈmem·bər }

unbonded strain gage [ENG] A type of strain gage that consists of a grid of fine wires strung under slight tension between a stationary frame and a movable armature; pressure applied to the bellows or to the diaphragm sensing element moves the armature with respect to the frame, increasing tension in one half of the filaments and decreasing tension in the rest. { ˌənˈbän·dəd ˈstrān ˌgāj }

uncage [ENG] To release the caging mechanism of a gyroscope, that is, the mechanism that erects the gyroscope or locks it in position. { ˌənˈkāj }

uncharged demolition target [ENG] A demolition target which has been prepared to receive the demolition agent, the necessary quantities of which have been calculated, packaged, and stored in a safe place. { ˌənˈchärjd ˌdem·əˈlish·ən ˌtär·gət }

unconfined explosion [ENG] Explosion occurring in the open air where the (atmospheric) pressure is constant. { ˌən·kənˈfīnd ikˈsplō·zhən }

uncouple [ENG] To unscrew or disengage. { ˌənˈkəp·əl }

underbody [ENG] The lower portion or underside of the body of a vehicle or airplane. { ˈən·dərˌbäd·ē }

undercut [ELECTR] Undesirable lateral etching by chemicals in the fabrication of semiconductor devices. [ENG] Underside recess either cut or molded into an object so as to leave a topside lip or protuberance. { ˈən·dərˌkət }

undercutting [CHEM ENG] In distillation, the technique of taking the products coming off the distillation tower at a temperature below the desired ultimate boiling point range to prevent contaminating the products with the compound that would distill just beyond the ultimate boiling point range. { ˌən·dərˈkəd·iŋ }

underdrain [CIV ENG] A subsurface drain with

holes into which water flows when the water table reaches the drain level. { 'ən·dərˌdrān }

underdrive press [MECH ENG] A mechanical press having the driving mechanism located within or under the bed. { 'ən·dərˌdrīv 'pres }

underfeed stoker [ENG] A coal-burning system in which green coal is fed from beneath the burning fuel bed. { 'ən·dərˌfēd 'stō·kər }

underfloor raceway [BUILD] A raceway for electric wires which runs beneath the floor. { 'ən·dərˌflȯr 'rāsˌwā }

underground [ENG] Situated, done, or operating beneath the surface of the ground. { ¦ən·dər¦graünd }

underhung crane [MECH ENG] An overhead traveling crane in which the end trucks carry the bridge suspended below the rails. { 'ən·dərˌhəŋ 'krān }

underpinning [CIV ENG] **1.** Permanent supports replacing or reinforcing the older supports beneath a wall or a column. **2.** Braced props temporarily supporting a structure. { 'ən·dərˌpin·iŋ }

underplate [DES ENG] An unfinished plate which forms part of an armored front for a mortise lock, and which is fastened to the case. { 'ən·dərˌplāt }

underream [ENG] To enlarge a drill hole below the casing. { ¦ən·dər¦rēm }

undershoot [CONT SYS] The amount by which a system's response to an abrupt change in input falls short of that desired. { 'ən·dərˌshüt }

undershot wheel [MECH ENG] A water wheel operated by the impact of flowing water against blades attached around the periphery of the wheel, the blades being partly or totally submerged in the moving stream of water. { 'ən·dərˌshät ˌwēl }

undersize [ENG] That part of a crushed material (for example, ore) which passes through a screen. { 'ən·dərˌsīz }

underspin [MECH] Property of a projectile having insufficient rate of spin to give proper stabilization. { 'ən·dərˌspin }

underwater sound projector [ENG ACOUS] A transducer used to produce sound waves in water. { ¦ən·dər¦wȯd·ər 'saünd prəˌjek·tər }

underwater transducer [ENG ACOUS] A device used for the generation or reception of underwater sounds. { ¦ən·dər¦wȯd·ər tranz'dü·sər }

underway bottom sampler *See* underway sampler. { ¦ən·dər¦wā 'bäd·əm ˌsam·plər }

underway sampler [ENG] A device for collecting samples of sediment on the ocean bottom, consisting of a cup in a hollow tube; on striking the bottom, the cup scoops up a small sample which is forced into the tube which is then closed with a lid, and the device is hoisted to the surface. Also known as scoopfish; underway bottom sampler. { ¦ən·dər¦wā 'sam·plər }

Underwood chart [CHEM ENG] A graphical solution of mass balances for a single equilibrium stage in the calculation of a solvent-extraction operation. { 'ən·dərˌwud ˌchärt }

Underwood distillation method [CHEM ENG] A method for calculation of liquid separations from binary distillation systems operated at partial reflux. { 'ən·dərˌwud ˌdis·tə'lā·shən ˌmeth·əd }

undisturbed [ENG] Pertaining to a sample of material, as of soil, subjected to so little disturbance that it is suitable for determinations of strength, consolidation, permeability characteristics, and other properties of the material in place. { ¦ən·di'stərbd }

unfinished bolt [DES ENG] One of three degrees of finish in which standard hexagon wrench-head bolts and nuts are available; only the thread is finished. { ¦ən'fin·isht 'bōlt }

unfired pressure vessel [CHEM ENG] A pressure vessel that is not in direct contact with a heating flame. { ¦ən'fīrd 'presh·ər ˌves·əl }

uniaxial stress [MECH] A state of stress in which two of the three principal stresses are zero. { ¦yü·nē'ak·sē·əl 'stres }

unidirectional hydrophone [ENG ACOUS] A hydrophone mainly sensitive to sound that is incident from a single solid angle of one hemisphere or less. { ¦yü·nə·də'rek·shən·əl 'hī·drəˌfōn }

unidirectional microphone [ENG ACOUS] A microphonethat is responsive predominantly to sound incident from one hemisphere, without picking up sounds from the sides or rear. { ¦yü·nə·də'rek·shən·əl 'mī·krəˌfōn }

unified screw thread [DES ENG] Three series of threads: coarse (UNC), fine (UNF), and extra fine (UNEF); a 1/4-inch-diameter (0.006-millimeter) thread in the UNC series has 20 threads per inch, while in the UNF series it has 28. { 'yü·nəˌfīd 'skrü ˌthred }

unifilar suspension [ENG] The suspension of a body from a single thread, wire, or strip. { ¦yü·nə'fil·ər sə'spen·chən }

uniflow engine [MECH ENG] A steam engine in which steam enters the cylinder through valves at one end and escapes through openings uncovered by the piston as it completes its stroke. { 'yü·nəˌflō 'en·jən }

uniform circular motion [MECH] Circular motion in which the angular velocity remains constant. { 'yü·nəˌfȯrm 'sər·kyə·lər 'mō·shən }

uniform click track [ENG ACOUS] A click track with regularly spaced clicks. { 'yü·nəˌfȯrm 'klik ˌtrak }

uniform load [MECH] A load distributed uniformly over a portion or over the entire length of a beam; measured in pounds per foot. { 'yü·nəˌfȯrm 'lōd }

uniform mat [CIV ENG] A type of foundation mat, consisting of a reinforced concrete slab of constant thickness, supporting walls, and columns; it is thick, rigid, and strong. { 'yü·nəˌfȯrm 'mat }

unijunction transistor [ELECTR] An *n*-type bar of semiconductor with a *p*-type alloy region on one side; connections are made to base contacts at either end of the bar and to the *p*-region. Abbreviated UJT. Formely known as double-base diode; double-base junction diode. { 'yü·nə ˌjəŋk·shən tran'zis·tər }

unilateral conductivity [ELECTR] Conductivity in only one direction, as in a perfect rectifier. { ¦yü·nə'lad·ə·rəl ˌkän·dək'tiv·əd·ē }

unilateral tolerance method [DES ENG] Method of dimensioning and tolerancing wherein the tolerance is taken as plus or minus from an explicitly stated dimension; the dimension represents the size or location which is nearest the critical condition (that is maximum material condition), and the tolerance is applied either in a plus or minus direction, but not in both directions, in such a way that the permissible variation in size or location is away from the critical condition. { ¦yü·nə'lad·ə·rəl 'täl·ə·rəns ˌmeth·əd }

union [DES ENG] A screwed or flanged pipe coupling usually in the form of a ring fitting around the outside of the joint. { 'yün·yən }

union joint [DES ENG] A threaded assembly used for the joining of ends of lengths of installed pipe or tubing where rotation of neither length is feasible. { 'yün·yən ˌjȯint }

union shop [IND ENG] An establishment in which union membership is not a requirement for original employment but becomes mandatory after a specified period of time. { 'yün·yən 'shäp }

unipolar [ELEC] Having but one pole, polarity, or direction; when applied to amplifiers or power supplies, it means that the output can vary in only one polarity from zero and, therefore, must always contain a direct-current component. { ¦yü·nə'pō·lər }

unipolar transistor [ELECTR] A transistor that utilizes charge carriers of only one polarity, such as a field-effect transistor. { ¦yü·nə'pō·lər tran'zis·tər }

unit [ENG] An assembly or device capable of independent operation, such as a radio receiver, cathode-ray oscilloscope, or computer subassembly that performs some inclusive operation or function. { 'yü·nət }

unitary air conditioner [MECH ENG] A small self-contained electrical unit enclosing a motor-driven refrigeration compressor, evaporative cooling coil, air-cooled condenser, filters, fans, and controls. { 'yü·nəˌter·ē 'er kənˌdish·ən·ər }

unit assembly [IND ENG] Assemblage of machine parts which constitutes a complete auxiliary part of an end item, and which performs a specific auxiliary function, and which may be removed from the parent item without itself being disassembled. { 'yü·nət ə'sem·blē }

unit charge *See* statcoulomb. { 'yü·nət 'chärj }

unit construction [BUILD] An assembly comprising two or more walls, plus floor and ceiling construction, ready for shipping to a building site. { 'yü·nət kən'strək·shən }

unit cost [IND ENG] Cost allocated to a specified unit of a product; computed as the cost over a period of time divided by the number of units produced. { 'yü·nət 'kȯst }

United States standard dry seal thread [DES ENG] A modified pipe thread used for pressure-tight connections that are to be assembled without lubricant or sealer in refrigeration pipes, automotive and aircraft fuel-line fittings, and gas and chemical shells. { yə'nīd·əd 'stāts 'stan·dərd 'drī ¦sēl ˌthred }

unit heater [MECH ENG] A heater consisting of a fan for circulating air over a heat-exchange surface, all enclosed in a common casing. { 'yü·nət 'hēd·ər }

unitized body [ENG] An automotive body that has the body and frame in one unit; side members are designed on the principle of a bridge truss to gain stiffness, and sheet metal of the body is stressed so that it carries some of the load. { 'yü·nəˌtīzd 'bäd·ē }

unitized cargo [IND ENG] Grouped cargo carried aboard a ship in pallets, containers, wheeled vehicles, and barges or lighters. { 'yü·nəˌtīzd 'kär·gō }

unitized load [IND ENG] A single item or a number of items packaged, packed, or arranged in a specified manner and capable of being handled as a unit; unitization may be accomplished by placing the item or items in a container or by banding them securely together. Also known as unit load. { 'yü·nəˌtīzd 'lōd }

unitized tooling [DES ENG] A die having its upper and lower members incorporated into a self-contained unit arranged to maintain the die members in alignment. { ¦yü·nəˌtīzd ¦tül·iŋ }

unit load *See* unitized load. { 'yü·nət 'lōd }

unit mold [ENG] A simple plastics mold composed of a simple cavity without further mold devices; used to produce sample containers having shapes difficult to blow-mold. { 'yü·nət 'mōld }

unit of issue [IND ENG] In reference to special storage, the quantity of an item, such as each number, dozen, gallon, pair, pound, ream, set, or yard. { 'yü·nət əv 'ish·ü }

unit operations [CHEM ENG] The basic physical operations of chemical engineering in a chemical process plant, that is, distillation, fluid transport, heat and mass transfer, evaporation, extraction, drying, crystallization, filtration, mixing, size separation, crushing and grinding, and conveying. { 'yü·nət ˌäp·ə'rā·shənz }

unit process [CHEM ENG] In chemical manufacturing, a process that involves chemical conversion. { 'yü·nət ˌprä¸ses }

unit procurement cost [IND ENG] The net basic cost paid or estimated to be paid for a unit of a particular item including, where applicable, the cost of government-furnished property and the cost of manufacturing operations performed at government-owned facilities. { 'yü·nət prə 'kyůr·mənt ˌkȯst }

unit strain [MECH] **1.** For tensile strain, the elongation per unit length. **2.** For compressive strain, the shortening per unit length. **3.** For shear strain, the change in angle between two lines originally perpendicular to each other. { 'yü·nət 'strān }

unit stress [MECH] The load per unit of area. { 'yü·nət 'stres }

unity power factor [ELEC] Power factor of 1.0, obtained when current and voltage are in phase, as in a circuit containing only resistance or in a reactive circuit at resonance. { 'yü·nəd·ē 'paù·ər ˌfak·tər }

univariant system [THERMO] A system which has only one degree of freedom according to the phase rule. { ˌyü·nə¦ver·ē·ənt 'sis·təm }

universal chuck [ENG] A self-centering chuck whose jaws move in unison when a scroll plate is rotated. { ˌyü·nə¦vər·səl 'chək }

universal dividing head [MECH ENG] An accessory fixture on a milling machine that rotates the workpiece to specified angles between machining steps. { ˌyü·nə¦vər·səl di'vīd·iŋ ˌhed }

universal gas constant *See* gas constant. { ˌyü·nə¦vər·səl 'gas ˌkän·stənt }

universal grinding machine [MECH ENG] A grinding machine having a swivel table and headstock, and a wheel head that can be rotated on its base. { ˌyü·nə¦vər·səl 'grīnd·iŋ məˌshēn }

universal gripper [CONT SYS] A versatile robot component that can grasp most kinds of objects. { ˌyü·nə¦vər·səl 'grip·ər }

universal instrument *See* altazimuth. { ˌyü·nə¦vər·səl 'inz·trə·mənt }

universal joint [MECH ENG] A linkage that transmits rotation between two shafts whose axes are coplanar but not coinciding. { ˌyü·nə¦vər·səl 'jȯint }

universal motor [ELEC] A motor that may be operated at approximately the same speed and output on either direct current or single-phase alternating current. Also known as ac/dc motor. { ˌyü·nə¦vər·səl 'mōd·ər }

universal output transformer [ENG ACOUS] An output transformer having a number of taps on its winding, to permit its use between the audio-frequency output stage and the loudspeaker of practically any radio receiver by proper choice of connections. { ˌyü·nə¦vər·səl 'aùt,pùt tranz ˌfȯr·mər }

universal robot [CONT SYS] A robot whose end effector would be flexible enough to perform any desired task. { ˌyü·nə¦vər·səl 'rō,bät }

universal vise [ENG] A vise which has two or three swivel settings so that the workpiece can be set at a compound angle. Also known as toolmaker's vise. { ˌyü·nə¦vər·səl 'vīs }

unloaded Q [ELECTR] The Q of a system when there is no external coupling to it. { ˌən'lōd·əd 'kyü }

unloader [MECH ENG] A power device for removing bulk materials from railway freight cars or highway trucks; in the case of railway cars, the car structure may aid the unloader; a transitional device between interplant transportation means and intraplant handling equipment. { ˌən'lōd·ər }

unloading [CHEM ENG] **1.** The release downstream of a trapped contaminant. **2.** A filter medium failure and release of system pressure. **3.** The depressuring or emptying of a process unit. { ˌən'lōd·iŋ }

unloading conveyor [MECH ENG] Any of several types of portable conveyors adapted for unloading bulk materials, packages, or objects from conveyances. { ˌən'lōd·iŋ kən'vā·ər }

unprotected reversing thermometer [ENG] A reversing thermometer for sea-water temperature which is not protected against hydrostatic pressure. { ˌən·prə'tek·təd ri'vərs·iŋ thər'mäm·əd·ər }

unrestricted element [IND ENG] An element of an operation that is entirely under the control of a worker. { ˌən·ri'strik·təd 'el·ə·mənt }

unscheduled maintenance [IND ENG] Those unpredictable maintenance requirements that had not been previously planned or programmed but require prompt attention and must be added to, integrated with, or substituted for previously scheduled workloads. { ˌən'skej·əld 'mānt·ən·əns }

unscrambler [IND ENG] A part of a feeding and packaging line that aids in arranging cartons for the filling machines; there are rotary, straight-line, and walking-beam types. { ˌən'skram·blər }

Unsin engine [MECH ENG] A type of rotary engine in which the trochoidal rotors of eccentric-rotor engines are replaced with two circular rotors, one of which has a single gear tooth upon which gas pressure acts, and the second rotor has a slot which accepts the gear tooth. { 'ən·sən ˌen·jən }

unsprung axle [MECH ENG] A rear axle in an automobile in which the housing carries the right and left rear-axle shafts and the wheels are mounted at the outer end of each shaft. { ˌən'sprəŋ 'ak·səl }

unsprung weight [MECH ENG] The weight of the various parts of a vehicle that are not carried on the springs, such as wheels, axles, and brakes. { ˌən'sprəŋ 'wāt }

unwater [ENG] To remove or draw off water; to drain. { ˌən'wód·ər }

unwind [MECH ENG] To reverse the direction of rotation of a threaded device. { ˌən'wīnd }

up [ENG] Fully in operation. { əp }

up-converter [ELECTR] Type of parametric amplifier which is characterized by the frequency of the output signal being greater than the frequency of the input signal. { 'əp kənˌvərd·ər }

up-Doppler [ENG ACOUS] The sonar situation wherein the target is moving toward the transducer, so the frequency of the echo is greater than the frequency of the reverberations received immediately after the end of the outgoing ping; opposite of down-Doppler. { 'əp ˌdäp·lər }

updraft carburetor [MECH ENG] For a gasoline engine, a fuel-air mixing device in which both the fuel jet and the airflow are upward. { 'əpˌdraft 'kär·bəˌrād·ər }

updraft furnace [MECH ENG] A furnace in which volumes of air are supplied from below the fuel bed or supply. { 'əpˌdraft 'fər·nəs }

uplift pressure [CIV ENG] Pressure in an upward direction against the bottom of a structure, as a dam, a road slab, or a basement floor. { 'əpˌlift ˌpresh·ər }

upmilling [MECH ENG] Milling a workpiece by rotating the cutter against the direction of feed of the workpiece. { 'əpˌmil·iŋ }

upper consolute temperature *See* consolute temperature. { 'əp·ər 'kän·səˌlüt 'tem·prə·chər }

upper control limit [IND ENG] A horizontal line on a control chart at a specified distance above the central line; if all the plotted points fall between the upper and lower control lines, the process is said to be in control. { ˌəp·ər kən'trōl ˌlim·ət }

upper critical solution temperature *See* consolute temperature. { 'əp·ər ˌkrid·ə·kəl səˌlü·shən 'tem·prə·chər }

upright [CIV ENG] A vertical structural member, post, or stake. { 'əpˌrīt }

upset [ENG] To increase the diameter of a rock drill by blunting the end. { əp'set }

upstand [BUILD] That section of a roof covering that turns up against a vertical surface. Also known as upturn. { 'əpˌstand }

upstream [CHEM ENG] That portion of a process stream that has not yet entered the system or unit under consideration; for example, upstream to a refinery or to a distillation column. { 'əpˌstrēm }

upstream face [CIV ENG] The side of a dam nearer the source of water. { 'əpˌstrēm 'fās }

uptake [ENG] A large pipe for exhaust gases from a boiler furnace that runs upward to a chimney or smokestack. { 'əpˌtāk }

up time [IND ENG] A period during which value is being added to a product by a machine or a process. { 'əp ˌtīm }

upturn *See* upstand. { 'əpˌtərn }

urbanization [CIV ENG] The state of being or becoming a community with urban characteristics. { ˌər·bə·nə'zā·shən }

urban renewal [CIV ENG] Redevelopment and revitalization of a deteriorated urban community. { 'ər·bən ri'nü·əl }

urea dewaxing [CHEM ENG] A continuous, petroleum refinery process used to produce low-pour-point oils; urea forms a filterable solid complex (adduct) with the straight-chain wax paraffins in the stock. { yu'rē·ə dē'waks·iŋ }

usability [IND ENG] The characteristics which enter into a product's design and are related to its quality and reliability that enable users to perform tasks quickly and error free, as well as reduce the time and mental effort to learn or operate the product. Also known as ease of use; user friendliness. { ˌyüz·ə'bil·əd·ē }

usable life *See* pot life. { 'yüz·ə·bəl 'līf }

user friendliness *See* usability. { 'yü·zər 'frend·lē·nəs }

U-shaped abutment [CIV ENG] A bridge abutment with wings perpendicular to the face which act as counterforts; a very stable abutment, often used for architectural effect. { 'yü ˌshāpt ə'bət·mənt }

utilidor [CIV ENG] An insulated, heated conduit built below the ground surface or supported above the ground surface to protect the contained water, steam, sewage, and fire lines from freezing. { yü'til·əˌdȯr }

utility [ENG] One of the nonprocess (support) facilities for a manufacturing plant; usually considered as facilities for steam, cooling water, deionized water, electric power, refrigeration, compressed and instrument air, and effluent treatment. { yü'til·əd·ē }

U-tube heat exchanger [CHEM ENG] A heat-exchanger system consisting of a bundle of U tubes (hairpin tubes) surrounded by a shell (outer vessel); one fluid flows through the tubes, and the other fluid flows through the shell, around the tubes. { 'yü ˌtüb 'hēt iksˌchān·jər }

U-tube manometer [ENG] A manometer consisting of a U-shaped glass tube partly filled with a liquid of known specific gravity; when the legs of the manometer are connected to separate sources of pressure, the liquid rises in one leg and drops in the other; the difference between the levels is proportional to the difference in pressures and inversely proportional to the liquid's specific gravity. Also known as liquid-column gage. { 'yü ˌtüb mə'näm·əd·ər }

U-value [ENG] A measure of heat transmission through a building part or a given thickness of insulating material, expressed as the number of British thermal units that will flow in 1 hour through 1 square foot of the structure or material from air to air with a temperature differential of 1°F. { 'yü ˌväl·yü }

V

V *See* electric potential; volt.
VA *See* volt-ampere.
vac *See* millibar.
vacuum brake [MECH ENG] A form of air brake which operates by maintaining low pressure in the actuating cylinder; braking action is produced by opening one side of the cylinder to the atmosphere so that atmospheric pressure, aided in some designs by gravity, applies the brake. { 'vak·yəm ˌbrāk }
vacuum breaker [ENG] A device used to relieve a vacuum formed in a water supply line to prevent backflow. Also known as backflow preventer. { 'vak·yəm ˌbrāk·ər }
vacuum cleaner [MECH ENG] An electrically powered mechanical appliance for the dry removal of dust and loose dirt from rugs, fabrics, and other surfaces. { 'vak·yəm ˌklē·nər }
vacuum concrete [CIV ENG] Concrete poured into a framework that is fitted with a vacuum mat to remove water not required for setting of the cement; in this framework, concrete attains its 28-day strength in 10 days and has a 25% higher crushing strength. { 'vak·yəm 'känˌkrēt }
vacuum crystallizer [CHEM ENG] Crystallizer in which a warm saturated solution is fed to a lagged, closed vessel maintained under vacuum; the solution evaporates and cools adiabatically, resulting in crystallization. { 'vak·yəm 'krist·əlˌīz·ər }
vacuum distillation [CHEM ENG] Liquid distillation under reduced (less than atmospheric) pressure; used to lower boiling temperatures and lessen the risk of thermal degradation during distillation. Also known as reduced-pressure distillation. { 'vak·yəm ˌdis·tə'lā·shən }
vacuum drying [ENG] The removal of liquid from a solid material in a vacuum system; used to lower temperatures needed for evaporation to avoid heat damage to sensitive material. { 'vak·yəm 'drī·iŋ }
vacuum evaporation [ENG] Deposition of thin films of metal or other materials on a substrate, usually through openings in a mask, by evaporation from a boiling source in a hard vacuum. { 'vak·yəm iˌvap·ə'rā·shən }
vacuum evaporator [ENG] A vacuum device used to evaporate metals and spectrographic carbon to coat (replicate) a specimen for electron spectroscopic analysis or for electron microscopy. { 'vak·yəm i'vap·əˌrād·ər }
vacuum filter [ENG] A filter device into which a liquid-solid slurry is fed to the high-pressure side of a filter medium, with liquid pulled through to the low-pressure side of the medium and a cake of solids forming on the outside of the medium. { 'vak·yəm ˌfil·tər }
vacuum filtration [ENG] The separation of solids from liquids by passing the mixture through a vacuum filter. { 'vak·yəm fil'trā·shən }
vacuum flashing [CHEM ENG] The heating of a liquid that, upon release to a lower pressure (vacuum), undergoes considerable vaporization (flashing). Also known as flash vaporization. { 'vak·yəm 'flash·iŋ }
vacuum forming [ENG] Plastic-sheet forming in which the sheet is clamped to a stationary frame, then heated and drawn down into a mold by vacuum. { 'vak·yəm 'fȯrm·iŋ }
vacuum freeze dryer [ENG] A type of indirect batch dryer used to dry materials that would be destroyed by the loss of volatile ingredients or by drying temperatures above the freezing point. { 'vak·yəm 'frēz ˌdrī·ər }
vacuum gage [ENG] A device that indicates the absolute gas pressure in a vacuum system. { 'vak·yəm ˌgāj }
vacuum gripper [CONT SYS] A robot component that uses a suction cup connected to a vacuum source to lift and handle objects. { 'vak·yəm 'grip·ər }
vacuum heating [MECH ENG] A two-pipe steam heating system in which a vacuum pump is used to maintain a suction in the return piping, thus creating a positive return flow of air and condensate. { 'vak·yəm 'hēd·iŋ }
vacuum mat [CIV ENG] A rigid flat metal screen faced by a linen filter, the back of which is kept under partial vacuum; used to suck out surplus air and water from poured concrete to produce a dense, well-shrunk concrete. { 'vak·yəm ˌmat }
vacuum measurement [ENG] The determination of a fluid pressure less in magnitude than the pressure of the atmosphere. { 'vak·yəm 'mezh·ər·mənt }
vacuum pan salt [CHEM ENG] A salt made from salt brine boiled at reduced pressure in a triple-effect evaporator. { 'vak·yəm ˈpan ˌsólt }

vacuum pencil [ENG] A pencillike length of tubing connected to a small vacuum pump, for picking up semiconductor slices or chips during fabrication of solid-state devices. { 'vak·yəm ˌpen·səl }

vacuum pump [MECH ENG] A compressor for exhausting air and noncondensable gases from a space that is to be maintained at subatmospheric pressure. { 'vak·yəm ˌpəmp }

vacuum relief valve [ENG] A pressure relief device which is designed to allow fluid to enter a pressure vessel in order to avoid extreme internal vacuum. { 'vak·yəm ri'lēf ˌvalv }

vacuum shelf dryer [ENG] A type of indirect batch dryer which generally consists of a vacuum-tight cubical or cylindrical chamber of cast-iron or steel plate, heated supporting shelves inside the chamber, a vacuum source, and a condenser; used extensively for drying pharmaceuticals, temperature-sensitive or easily oxidizable materials, and small batches of high-cost products where any product loss must be avoided. { 'vak·yəm 'shelfˌdrī·ər }

vacuum support [MECH ENG] That portion of a rupture disk device which prevents deformation of the disk resulting from vacuum or rapid pressure change. { 'vak·yəm səˌpȯrt }

vacuum-tube voltmeter [ENG] Any of several types of instrument in which vacuum tubes, acting as amplifiers or rectifiers, are used in circuits for the measurement of alternating-current or direct-current voltage. Abbreviated VTVM. Also known as tube voltmeter. { 'vak·yəm ˌtüb 'vōltˌmēd·ər }

vacuum-type insulation [CHEM ENG] Highly reflective double-wall structure with high vacuum between the walls; used as insulation for cryogenic systems; Dewar flasks have vacuum-type insulation. { 'vak·yəm ˌtīp in·sə'lā·shən }

VAD *See* vapor-phase axial deposition. { vad *or* ˌvē,ā'dē }

valley [BUILD] An inside angle formed where two sloping sides intersect. { 'val·ē }

valley rafter [BUILD] A part of the roof frame that extends diagonally from an inside corner plate to the ridge board at the intersection of two roof surfaces. { 'val·ē ˌraf·tər }

valley roof [BUILD] A pitched roof with one or more valleys. { 'val·ē ˌrüf }

value analysis *See* value engineering. { 'val·yü əˌnal·ə·səs }

value control *See* value engineering. { 'val·yü kənˌtrōl }

value engineering [IND ENG] The systematic application of recognized techniques which identify the function of a product or service, and provide the necessary function reliably at lowest overall cost. Also known as value analysis; value control. { 'val·yü ˌen·jəˌnir·iŋ }

value theory [SYS ENG] A concept normally associated with decision theory; it strives to evaluate relative utilities of simple and mixed parameters which can be used to describe outcomes. { 'val·yü ˌthē·ə·rē }

valve *See* electron tube. [MECH ENG] A device used to regulate the flow of fluids in piping systems and machinery. { valv }

valve follower [MECH ENG] A linkage between the cam and the push rod of a valve train. { 'valv ˌfäl·ə·wər }

valve guide [MECH ENG] A channel which supports the stem of a poppet valve for maintenance of alignment. { 'valv ˌgīd }

valve head [MECH ENG] The disk part of a poppet valve that gives a tight closure on the valve seat. { 'valv ˌhed }

valve-in-head engine *See* overhead-valve engine. { ˌvalv in ˌhed 'en·jən }

valve lifter [MECH ENG] A device for opening the valve of a cylinder as in an internal combustion engine. { 'valv ˌlif·tər }

valve positioner [CONT SYS] A pneumatic servomechanism which is used as a component in process control systems to improve operating characteristics of valves by reducing hysteresis. Also known as pneumatic servo. { 'valv pəˌzish·ə·nər }

valve seat [DES ENG] The circular metal ring on which the valve head of a poppet valve rests when closed. { 'valv ˌsēt }

valve stem [MECH ENG] The rod by means of which the disk or plug is moved to open and close a valve. { 'valv ˌstem }

valve train [MECH ENG] The valves and valve-operating mechanism for the control of fluid flow to and from a piston-cylinder machine, for example, steam, diesel, or gasoline engine. { 'valv ˌtrān }

van der Waals surface tension formula [THERMO] An empirical formula for the dependence of the surface tension on temperature: $\gamma = Kp_c^{2/3} T_c^{1/3} (1 - T/T_c)^n$, where γ is the surface tension, T is the temperature, T_c and p_c are the critical temperature and pressure, K is a constant, and n is a constant equal to approximately 1.23. { 'van dər ˌwōlz 'sər·fəs ˌten·chən ˌfȯr·myə·lə }

Van Dorn sampler [ENG] A sediment sampler that consists of a Plexiglas cylinder closed at both ends by rubber force cups; in the armed position the cups are pulled outside the cylinder and restrained by a releasing mechanism, and after the sample is taken, a length of surgical rubber tubing connecting the cups is sufficiently prestressed to permit the force cups to retain the sample in the cylinder. { van 'dȯrn ˌsam·plər }

vane [MECH ENG] A flat or curved surface exposed to a flow of fluid so as to be forced to move or to rotate about an axis, to rechannel the flow, or to act as the impeller; for example, in a steam turbine, propeller fan, or hydraulic turbine. { vān }

vane anemometer [ENG] A portable instrument used to measure low wind speeds and airspeeds in large ducts; consists of a number of vanes radiating from a common shaft and set to rotate when facing the wind. { 'vān anˌ·ə'mäm·əd·ər }

vane motor rotary actuator [MECH ENG] A type of rotary motor actuator which consists of a rotor with several spring-loaded sliding vanes in an elliptical chamber; hydraulic fluid enters the

chamber and forces the vanes before it as it moves to the outlets. { 'vān ¦mōd·ər 'rōd·ə·rē 'ak·chə,wād·ər }

vane-type instrument [ENG] A measuring instrument utilizing the force of repulsion between fixed and movable magnetized iron vanes, or the force existing between a coil and a pivoted vane-shaped piece of soft iron, to move the indicating pointer. { 'vān ,tīp ,in·strə·mənt }

vapor [THERMO] A gas at a temperature below the critical temperature, so that it can be liquefied by compression, without lowering the temperature. { 'vā·pər }

vapor barrier [CIV ENG] A layer of material applied to the inner (warm) surface of a concrete wall or floor to prevent absorption and condensation of moisture. { 'vā·pər ,bar·ē·ər }

vapor-compression cycle [MECH ENG] A refrigeration cycle in which refrigerant is circulated through a machine which allows for successive boiling (or vaporization) of liquid refrigerant as it passes through an expansion valve, thereby producing a cooling effect in its surroundings, followed by compression of vapor to liquid. { 'vā·pər kəm'presh·ən ,sī·kəl }

vapor cycle [THERMO] A thermodynamic cycle, operating as a heat engine or a heat pump, during which the working substance is in, or passes through, the vapor state. { 'vā·pər ,sī·kəl }

vapor degreasing [ENG] A type of cleaning procedure for metals to remove grease, oils, and lightly attached solids; a solvent such as trichloroethylene is boiled, and its vapors are condensed on the metal surfaces. { 'vā·pər dē 'grēs·iŋ }

vapor-filled thermometer [ENG] A gas- or vapor-filled temperature measurement device that moves or distorts in response to temperature-induced pressure changes from the expansion or contraction of the sealed, vapor-containing chamber. { 'vā·pər ¦fild thər'mäm·əd·ər }

vaporimeter [ENG] An instrument used to measure a substance's vapor pressure, especially that of an alcoholic liquid, in order to determine its alcohol content. { ,vap·ə'rim·əd·ər }

vaporization *See* volatilization. { ,vā·pə·rə'zā·shən }

vaporization coefficient [THERMO] The ratio of the rate of vaporization of a solid or liquid at a given temperature and corresponding vapor pressure to the rate of vaporization that would be necessary to produce the same vapor pressure at this temperature if every vapor molecule striking the solid or liquid were absorbed there. { ,vā·pə·rə'zā·shən ,kō·ə·fish·ənt }

vaporization cooling [ENG] Cooling by volatilization of a nonflammable liquid having a low boiling point and high dielectric strength; the liquid is flowed or sprayed on hot electronic equipment in an enclosure where it vaporizes, carrying the heat to the enclosure walls, radiators, or heat exchanger. Also known as evaporative cooling. { ,vā·pə·rə'zā·shən ,kül·iŋ }

vaporizer [CHEM ENG] A process vessel in which a liquid is heated until it vaporizes; heat can be indirect (steam or heat-transfer fluid) or direct (hot gases or submerged combustion). { 'vā·pə,rīz·ər }

vapor-liquid separation [CHEM ENG] The removal of liquid droplets from a flowing stream of gas or vapor; accomplished by impingement, cyclonic action, and absorption or adsorption operations. { 'vā·pər 'lik·wəd ,sep·ə'rā·shən }

vapor-phase axial deposition [ENG] A method of fabricating graded-index optical fibers in which fine glass particles of silicon dioxide and germanium dioxide are synthesized and deposited on a rotating seed rod, and the synthesized porous preform is then pulled up and passes through a hot zone, undergoing dehydration and sintering, to become a porous preform. Abbreviated VAD. { 'vā·pər ¦fāz 'ak·sē·əl ,dep·ə'zish·ən }

vapor-phase reactor [CHEM ENG] A heavy steel vessel for carrying out chemical reactions on an industrial scale where efficient control over a vapor phase is needed, for example, in an oxidation process. { 'vā·pər ¦fāz rē'ak·tər }

vapor pressure [THERMO] For a liquid or solid, the pressure of the vapor in equilibrium with the liquid or solid. { 'vā·pər ,presh·ər }

vapor-pressure thermometer [ENG] A thermometer in which the vapor pressure of a homogeneous substance is measured and from which the temperature can be determined; used mostly for low-temperature measurements. { 'vā·pər ¦presh·ər thər'mäm·əd·ər }

vapor rate [CHEM ENG] In distillation, the upward flow rate of vapor through a distillation column. { 'vā·pər ,rāt }

vapor-recovery unit [ENG] **1.** A device or system to catch vaporized materials (usually fuels or solvents) as they are vented. **2.** In petroleum refining, a process unit to which gases and vaporized gasoline from various processing operations are charged, separated, and recovered for further use. { 'vā·pər ri'kəv·ə·rē ,yü·nət }

vara [CIV ENG] A surveyors' unit of length equal to $33\frac{1}{3}$ inches (84.7 centimeters). { 'vär·ə }

varactor [ELECTR] A semiconductor device characterized by a voltage-sensitive capacitance that resides in the space-charge region at the surface of a semiconductor bounded by an insulating layer. Also known as varactor diode; variable-capacitance diode; varicap; voltage-variable capacitor. { va'rak·tər }

varactor diode *See* varactor. { va'rak·tər 'dī,ōd }

varactor tuning [ELECTR] A method of tuning in which varactor diodes are used to vary the capacitance of a tuned circuit. { va'rak·tər 'tün·iŋ }

var hour meter [ENG] An instrument that measures and registers the integral of reactive power over time in the circuit to which it is connected. { 'var ¦aůr ,mēd·ər }

variable-area meter [ENG] A flowmeter that works on the principle of a variable restrictor in the flowing stream being forced by the fluid to a position to allow the required flow-through. { 'ver·ē·ə·bəl ¦er·ē·ə 'mēd·ər }

variable-area track [ENG ACOUS] A sound track divided laterally into opaque and transparent areas; a sharp line of demarcation between these areas corresponds to the waveform of the recorded signal. { 'ver·ē·ə·bəl ˌer·ē·ə 'trak }

variable attenuator [ELECTR] An attenuator for reducing the strength of an alternating-current signal either continuously or in steps, without causing appreciable signal distortion, by maintaining a substantially constant impedance match. { 'ver·ē·ə·bəl ə'ten·yəˌwād·ər }

variable-capacitance diode *See* varactor. { 'ver·ē·ə·bəl kəˌpas·əd·əns 'dīˌōd }

variable capacitor [ELEC] A capacitor whose capacitance can be varied continuously by moving one set of metal plates with respect to another. { 'ver·ē·ə·bəl kə'pas·əd·ər }

variable click track [ENG ACOUS] A click track with irregularly spaced clicks. { 'ver·ē·ə·bəl 'klik ˌtrak }

variable costs [IND ENG] Costs which vary directly with the number of units produced; direct labor and material are examples. { 'ver·ē·ə·bəl 'kȯsts }

variable-density sound track [ENG ACOUS] A constant-width sound track in which the average light transmission varies along the longitudinal axis in proportion to some characteristic of the applied signal. { 'ver·ē·ə·bəl ˌden·səd·ē 'saůn ˌtrak }

variable-depth sonar [ENG] Sonar in which the projector and receiving transducer are mounted in a watertight pod that can be lowered below a vessel to an optimum depth for minimizing thermal effects when detecting underwater targets. { 'ver·ē·ə·bəl ˌdepth 'sōˌnär }

variable element [IND ENG] **1.** An element with a time that varies significantly from cycle to cycle as a function of one or more variables occurring within the job. **2.** An element that is common to two different jobs but whose time varies because of differences between the two jobs. { ˌvər·ē·ə·bəl 'el·ə·mənt }

variable force [MECH] A force whose direction or magnitude or both change with time. { 'ver·ē·ə·bəl 'fȯrs }

variable-inductance accelerometer [ENG] An accelerometer consisting of a differential transformer with three coils and a mass which passes through the coils and is suspended from springs; the center coil is excited from an external alternating-current power source, and two end coils connected in series opposition are used to produce an ac output which is proportional to the displacement of the mass. { 'ver·ē·ə·bəl inˌdək·təns ikˌsel·ə'räm·əd·ər }

variable-pitch propeller [ENG] A controllable-pitch propeller whose blade angle may be adjusted to any angle between the low and high pitch limits. { 'ver·ē·ə·bəl ˌpich prə'pel·ər }

variable radio-frequency radiosonde [ENG] A radiosonde whose carrier frequency is modulated by the magnitude of the meteorological variables being sensed. { 'ver·ē·ə·bəl 'rād·ē·ō ˌfrē·kwən·sē 'rād·ē·ōˌsänd }

variable-reluctance microphone *See* magnetic microphone. { 'ver·ē·ə·bəl riˌlək·təns 'mī·krəˌfōn }

variable-reluctance pickup [ENG ACOUS] A phonograph pickup that depends for its operation on variations in the reluctance of a magnetic circuit due to the movements of an iron stylus assembly that is a part of the magnetic circuit. Also known as magnetic cartridge; magnetic pickup; reluctance pickup. { 'ver·ē·ə·bəl riˌlək·təns 'pikˌəp }

variable-resistance accelerometer [ENG] Any accelerometer which operates on the principle that electrical resistance of any conductor is a function of its dimensions; when the dimensions of the conductor are varied mechanically, as constant current flows through it, the voltage across it varies as a function of this mechanical excitation; examples include the strain-gage accelerometer, and an accelerometer making use of a slide-wire potentiometer. { 'ver·ē·ə·bəl riˌzis·təns ikˌsel·ə'räm·əd·ər }

variable resistor *See* rheostat. { 'ver·ē·ə·bəl ri'zis·tər }

variable-sequence robot [CONT SYS] A robot controlled by instructions that can be modified. { 'ver·ē·ə·bəl ˌsē·kwəns 'rōˌbät }

variable-speed drive [MECH ENG] A mechanism transmitting motion from one shaft to another that allows the velocity ratio of the shafts to be varied continuously. { 'ver·ē·ə·bəl ˌspēd 'drīv }

variable-volume air system [MECH ENG] An air-conditioning system in which the volume of air delivered to each controlled zone is varied automatically from a preset minimum to a maximum value, depending on the load in each zone. { ˌver·ē·ə·bəl ˌväl·yəm 'er ˌsis·təm }

varicap *See* varactor. { 'varˌkap }

variety [SYS ENG] The logarithm (usually to base 2) of the number of discriminations that an observer or a sensing system can make relative to a system. { və'rī·əd·ē }

Varignon's theorem [MECH] The theorem that the moment of a force is the algebraic sum of the moments of its vector components acting at a common point on the line of action of the force. { varˌän'yōnz ˌthirˌəm }

variograph [ENG] A recording variometer. { 'ver·ē·əˌgraf }

variometer [ENG] A geomagnetic device for detecting and indicating changes in one of the components of the terrestrial magnetic field vector, usually magnetic declination, the horizontal intensity component, or the vertical intensity component. { ˌver·ē'äm·əd·ər }

varistor [ELECTR] A two-electrode semiconductor device having a voltage-dependent nonlinear resistance; its resistance drops as the applied voltage is increased. Also known as voltage-dependent resistor. { və'ris·tər }

varmeter [ENG] An instrument for measuring reactive power in vars. Also known as reactive volt-ampere meter. { 'värˌmēd·ər }

V belt [DES ENG] An endless power-transmission belt with a trapezoidal cross section which

runs in a pulley with a V-shaped groove; it transmits higher torque at less width and tension than a flat belt. [MECH ENG] A belt, usually endless, with a trapezoidal cross section which runs in a pulley with a V-shaped groove, with the top surface of the belt approximately flush with the top of the pulley. { 'vē ˌbelt }

V-bend die [MECH ENG] A die with a triangular cross-sectional opening to provide two edges over which bending is accomplished. { 'vē ¦bend 'dī }

V block [ENG] A square or rectangular steel block having a 90° V groove through the center, and sometimes provided with clamps to secure round workpieces. { 'vē ˌbläk }

V-bucket carrier [MECH ENG] A conveyor consisting of two strands of roller chain separated by V-shaped steel buckets; used for elevating and conveying nonabrasive materials, such as coal. { 'vē ¦bək·ət ˌkar·ē·ər }

V cut [ENG] In mining and tunneling, a cut where the material blasted out in plan is like the letter V; usually consists of six or eight holes drilled into the face, half of which form an acute angle with the other half. { 'vē ˌkət }

vectopluviometer [ENG] A rain gage or array of rain gages designed to measure the inclination and direction of falling rain; vectopluviometers may be constructed in the fashion of a wind vane so that the receiver always faces the wind, or they may consist of four or more receivers arranged to point in cardinal directions. { ¦vek·tō‚plü·vē'äm·əd·ər }

vector impedance meter [ENG] An instrument that not only determines the ratio between voltage and current, to give the magnitude of impedance, but also determines the phase difference between these quantities, to give the phase angle of impedance. { 'vek·tər im'pēd·ənsˌmēd·ər }

vector momentum *See* momentum. { 'vek·tər mə'men·təm }

vector power [ELEC] Vector quantity equal in magnitude to the square root of the sum of the squares of the active power and the reactive power. { 'vek·tər ˌpaú·ər }

vector-power factor [ELEC] Ratio of the active power to the vector power; it is the same as power factor in the case of simple sinusoidal quantities. { 'vek·tər ¦paü·ər ˌfak·tər }

vector voltmeter [ENG] A two-channel high-frequency sampling voltmeter that measures phase as well as voltage of two input signals of the same frequency. { 'vek·tər 'vōlt‚mēd·ər }

vee path [ENG] In ultrasonic testing, the path of an angle beam from an ultrasonic search unit in which the waves are reflected off the opposite surface of the test piece and returned to the examination surface in a manner which has the appearance of the letter V. { 'vē ˌpath }

vegetable tanning [ENG] Leather tanning using plant extracts, such as tannic acid. { 'vej·tə·bəl 'tan·iŋ }

vehicle [MECH ENG] A self-propelled wheeled machine that transports people or goods on or off roads; automobiles and trucks are examples. { 'vē·ə·kəl }

velocimeter [ENG] An instrument for measuring the speed of sound in water; two transducers transmit acoustic pulses back and forth over a path of fixed length, each transducer immediately initiating a pulse upon receiving the previous one; the number of pulses occurring in a unit time is measured. { ˌvel·ə'sim·əd·ər }

velocity [MECH] **1.** The time rate of change of position of a body; it is a vector quantity having direction as well as magnitude. Also known as linear velocity. **2.** The speed at which the detonating wave passes through a column of explosives, expressed in meters or feet per second. { və'läs·əd·ē }

velocity analysis [MECH] A graphical technique for the determination of the velocities of the parts of a mechanical device, especially those of a plane mechanism with rigid component links. { və'läs·əd·ē ə‚nal·ə·səs }

velocity constant [CONT SYS] The ratio of the rate of change of the input command signal to the steady-state error, in a control system where these two quantities are proportional. { və'läs·əd·ē ˌkän·stənt }

velocity control *See* rate control. { və'läs·əd·ē kən‚trōl }

velocity error [CONT SYS] The difference between the rate of change of the actual position of a control system component and the rate of change of the desired position. { və'läs·əd·ē ˌer·ər }

velocity-head tachometer [ENG] A type of tachometer in which the device whose speed is to be measured drives a pump or blower, producing a fluid flow, which is converted to a pressure. { və'läs·əd·ē ¦hed tə'käm·əd·ər }

velocity hydrophone [ENG ACOUS] A hydrophone in which the electric output essentially matches the instantaneous particle velocity in the impressed sound wave. { və'läs·əd·ē 'hī·drəˌfōn }

velocity microphone [ENG ACOUS] A microphone whose electric output depends on the velocity of the air particles that form a sound wave; examples are a hot-wire microphone and a ribbon microphone. { və'läs·əd·ē 'mī·krəˌfōn }

velocity pressure *See* wind pressure. { və'läs·əd·ē ˌpresh·ər }

velocity ratio [MECH ENG] The ratio of the velocity given to the effort or input of a machine to the velocity acquired by the load or output. { və'läs·əd·ē ˌrā·shō }

velocity servomechanism [CONT SYS] A servomechanism in which the feedback-measuring device generates a signal representing a measured value of the velocity of the output shaft. Also known as rate servomechanism. { və'läs·əd·ē 'sər·vōˌmek·əˌniz·əm }

velocity-type flowmeter [ENG] A turbine-type fluid-flow measurement device in which the fluid

flow actuates the movement of a wheel or turbine-type impeller, giving a volume-time reading. Also known as current meter; rotating meter. { və'läs·əd·ē ¦tīp 'flō,mēd·ər }

veneered construction [BUILD] A type of construction in which the framework is faced with a thin external layer of material, such as marble. { və¦nird kən'strək·shən }

vent [ENG] **1.** A small passage made with a needle through stemming, for admitting a squib to enable the charge to be lighted. **2.** A hole, extending up through the bearing at the top of the core-barrel inner tube, which allows the water and air in the upper part of the inner tube to escape into the borehole. **3.** A small hole in the upper end of a core-barrel inner tube that allows water and air in the inner tube to escape into the annular space between the inner and outer barrels. **4.** An opening provided for the discharge of pressure or the release of pressure from tanks, vessels, reactors, processing equipment, and so on. **5.** A pipe for providing airflow to or from a drainage system or for circulating air within the system to protect trap seals from siphonage and back pressure. { vent }

vented baffle *See* reflex baffle. { 'ven·təd 'baf·əl }

ventilation [ENG] Provision for the movement, circulation, and quality control of air in an enclosed space. { ˌvent·əl'ā·shən }

ventilator [ENG] A device with an adjustable aperture for regulating the flow of fresh or stagnant air. [MECH ENG] A mechanical apparatus for producing a current of air, as a blowing or exhaust fan. { 'vent·əlˌād·ər }

vent stack [BUILD] The portion of a soil stack above the highest fixture. { 'vent ˌstak }

venture life [IND ENG] The period of time during which expenditures and reimbursements involving a given venture occur. Also known as financial life. { 'ven·chər ˌlīf }

venturi flume [ENG] An open flume with a constricted flow which causes a drop in the hydraulic grade line; used in flow measurement. { ven 'tůr·ē ˌflüm }

venturi meter [ENG] An instrument for efficiently measuring fluid flow rate in a piping system; a nozzle section increases velocity and is followed by an expanding section for recovery of kinetic energy. { ven'tůr·ē ˌmēd·ər }

venturi scrubber [CHEM ENG] A gas-cleaning device in which liquid injected at the throat of a venturi is used to scrub dust and mist from the gas flowing through the venturi. { ven'tůr·ē 'skrəb·ər }

venturi tube [ENG] A constriction that is placed in a pipe and causes a drop in pressure as fluid flows through it, consisting essentially of a short straight pipe section or throat between two tapered sections; it can be used to measure fluid flow rate (a venturi meter), or to draw fuel into the main flow stream, as in a carburetor. { ven'tůr·ē ˌtüb }

verbal information verification [ENG ACOUS] A method of talker authentication that involves checking the content of a spoken password or pass-phrase, such as a personal identification number, a social security number, or a mother's maiden name. Abbreviated VIV. { ˌvər·bəl ˌin·fərˌmā·shən ˌver·i·fə'kā·shən }

verge [BUILD] The edge of a sloping roof which projects over a gable. { vərj }

vergeboard [BUILD] One of the boards utilized as the finish of the eaves on the gable end of a structure. Also known as bargeboard; gableboard. { 'vərjˌbȯrd }

verglas *See* glaze. { vər'glä }

vernier [ENG] A short, auxiliary scale which slides along the main instrument scale to permit accurate fractional reading of the least main division of the main scale. { 'vər·nē·ər }

vernier caliper [ENG] A caliper rule with an attached vernier scale. { 'vər·nē·ər 'kal·ə·pər }

vernier dial [ENG] A tuning dial in which each complete rotation of the control knob causes only a fraction of a revolution of the main shaft, permitting fine and accurate adjustment. { 'vər·nē·ər 'dīl }

vertical band saw [MECH ENG] A band saw whose blade operates in the vertical plane; ideal for contour cutting. { 'vərd·ə·kəl 'band ˌsȯ }

vertical boiler [MECH ENG] A fire-tube boiler having vertical tubes between top head and tube sheet, connected to the top of an internal furnace. { 'vərd·ə·kəl 'bȯi·lər }

vertical boring mill [MECH ENG] A large type of boring machine in which a rotating workpiece is fastened to a horizontal table, which resembles a four-jaw independent chuck with extra radial T slots, and the tool has a traverse motion. { 'vərd·ə·kəl 'bȯr·iŋ ˌmil }

vertical broaching machine [MECH ENG] A broaching machine having the broach mounted in the vertical plane. { 'vərd·ə·kəl 'brōch·iŋ məˌshēn }

vertical compliance [ENG ACOUS] The ability of a stylus to move freely in a vertical direction while in the groove of a phonograph record. { 'vərd·ə·kəl kəm'plī·əns }

vertical conveyor [MECH ENG] A materials-handling machine designed to move or transport bulk materials or packages upward or downward. { 'vərd·ə·kəl kən'vā·ər }

vertical-current recorder [ENG] An instrument which records the vertical electric current in the atmosphere. { 'vərd·ə·kəl ¦kə·rənt riˌkȯrd·ər }

vertical curve [CIV ENG] A curve inserted between two lengths of a road or railway which are at different slopes. { 'vərd·ə·kəl 'kərv }

vertical drop [MECH] The drop of an object in trajectory or along a plumb line, measured vertically from its line of departure to the object. { 'vərd·ə·kəl 'dräp }

vertical-face breakwater [CIV ENG] A breakwater whose mound of rubble does not rise above the water, but is surmounted by a vertical-face superstructure of masonry or concrete; may be built without mound rubble, provided sea bed is firm. { 'vərd·ə·kəl ¦fās 'brākˌwȯd·ər }

vertical field balance [ENG] An instrument that

measures the vertical component of the magnetic field by means of the torque that the field component exerts on a horizontal permanent magnet. { 'vərd·ə·kəl 'fēld ˌbal·ənS }

vertical firing [MECH ENG] The discharge of fuel and air perpendicular to the burner in a furnace. { 'vərd·ə·kəl 'fīr·iŋ }

vertical force instrument *See* heeling adjuster. { 'vərd·ə·kəl ˈfȯrs 'in·strə·mənt }

vertical guide idlers [MECH ENG] Idler rollers about 3 inches (8 centimeters) in diameter so placed as to make contact with the edge of the belt conveyor should it run too much to one side. { 'vərd·ə·kəl ˈgīd 'īd·lərz }

vertical intensity variometer [ENG] A variometer employing a large permanent magnet and equipped with very fine steel knife-edges or pivots resting on agate planes or saddles and balanced so that its magnetic axis is horizontal. Also known as Z variometer. { 'vərd·ə·kəl in ˌten·səd·ē ˌver·ē'äm·əd·ər }

vertical-lift bridge [CIV ENG] A movable bridge with a span that rises on towers, lifted by steel ropes. { 'vərd·ə·kəl ˈlift 'brij }

vertical-lift gate [CIV ENG] A dam spillway gate of which the movable parts are raised and lowered vertically to regulate water flow. { 'vərd·ə·kəl ˈlift 'gāt }

vertical metal oxide semiconductor technology [ELECTR] For semiconductor devices, a technology that involves essentially the formation of four diffused layers in silicon and etching of a V-shaped groove to a precisely controlled depth in the layers, followed by deposition of metal over silicon dioxide in the groove to form the gate electrode. Abbreviated VMOS technology. { 'vərd·ə·kəl ˌmed·əl ˈäk‚sīd ˈsem·i·kən‚dək·tər tek'näl·ə·jē }

vertical obstacle sonar [ENG] An active sonar used to determine heights of objects in the path of a submersible vehicle; its beam sweeps along a vertical plane, about 30° above and below the direction of the vehicle's motion. Abbreviated VOS. { 'vərd·ə·kəl ˈäb·stə·kəl 'sō‚när }

vertical recording [ELECTR] Magnetic recording in which bits are magnetized in directions perpendicular to the surface of the recording medium, allowing the bits to be smaller. Also known as perpendicular recording. [ENG ACOUS] A type of disk recording in which the groove modulation is perpendicular to the surface of the recording medium, so the cutting stylus moves up and down rather than from side to side during recording. Also known as hill-and-dale recording. { 'vərd·ə·kəl ri'kȯrd·iŋ }

vertical scale [DES ENG] The ratio of the vertical dimensions of a laboratory model to those of the natural prototype; usually exaggerated in relation to the horizontal scale. { 'vərd·ə·kəl 'skāl }

vertical seismograph [ENG] An instrument that records the vertical component of the ground motion during an earthquake. { 'vərd·ə·kəl 'sīz·mə‚graf }

vertical traverse [MECH ENG] The angle through which a robot's arm can swing up and down, typically 30°. { 'vərd·ə·kəl trə'vərs }

vertical turbine pump *See* deep-well pump. { 'vərd·ə·kəl 'tər·bən ˌpəmp }

vertical turret lathe [DES ENG] Similar in principle to the horizontal turret lathe but capable of handling heavier, bulkier workpieces; it is constructed with a rotary, horizontal worktable whose diameter (30–74 inches, or 76–188 centimeters) normally designates the capacity of the machine; a crossrail mounted above the worktable carries a turret, which indexes in a vertical plane with tools that may be fed either across or downward. { 'vərd·ə·kəl 'tə·rət ˌlāth }

very high frequency oscillator [ELECTR] An oscillator whose frequency lies in the range from a few to several hundred megahertz; it uses distributed, rather than lumped, impedances, such as parallel wire transmission lines or coaxial cables. { ˌver·ē ˌhī 'frē·kwən·sē 'äs·ə‚lad·ər }

very high frequency tuner [ELECTR] A tuner in a television receiver for reception of stations transmitting in the very high frequency band; it generally has 12 discrete positions corresponding to channels 2–13. { ˌver·ē ˌhī 'frē·kwən·sē 'tün·ər }

very large scale integrated circuit [ELECTR] A complex integrated circuit that contains between 20,000 and 1,000,000 transistors. Abbreviated VLSI circuit. { ˌver·ē ˌlärj ˌskāl 'int·ə‚grād·əd 'sər·kət }

vessel [ENG] A container or structural envelope in which materials are processed, treated, or stored; for example, pressure vessels, reactor vessels, agitator vessels, and storage vessels (tanks). { 'ves·əl }

vestibule [BUILD] A hall or chamber between the outer door and the interior, or rooms, of a building. { 'ves·tə‚byül }

vestibule school [IND ENG] A school organized by an industrial concern to train new employees in specific tasks or prepare employees for promotion. { 'ves·tə‚byül ˌskül }

vestibule training [IND ENG] A procedure used in operator training in which the training location is separate from the main productive areas of the plant; includes student carrels, lecture rooms, and in many instances the same type of equipment that the trainee will use in the work station. { 'ves·tə‚byül ˌtrān·iŋ }

VGC *See* viscosity-gravity constant.

V guide [MECH ENG] A V-shaped groove serving to guide a wedge-shaped sliding machine element. { 'vē ˌgīd }

VI *See* viscosity index.

via [ELECTR] A pathway that is etched to allow electrical contact between different layers of a semiconductor device. { 'vē·ə *or* 'vī·ə }

viaduct [CIV ENG] A bridge structure supported on high towers with short masonry or reinforced concrete arched spans. { 'vī·ə‚dəkt }

via point [CONT SYS] A point located midway between the starting and stopping positions of a robot tool tip, through which the tool tip passes

without stopping. Also known as way point. { 'vē·ə ˌpȯint }

vibrating conveyor *See* oscillating conveyor. { 'vī,brād·iŋ kən'vā·ər }

vibrating coring tube [ENG] A sediment corer made to vibrate in order to eliminate the resistance of compacted ocean floor sediments, sands, and gravel. { 'vī,brād·iŋ 'kȯr·iŋ ˌtüb }

vibrating feeder [MECH ENG] A feeder for bulk materials (pulverized or granulated solids), which are moved by the vibration of a slightly slanted, flat vibrating surface. { 'vī,brād·iŋ 'fēd·ər }

vibrating grizzlies [MECH ENG] Bar grizzlies mounted on eccentrics so that the entire assembly is given a forward and backward movement at a speed of some 100 strokes a minute. { 'vī,brād·iŋ 'griz·lēz }

vibrating needle [ENG] A magnetic needle used in compass adjustment to find the relative intensity of the horizontal components of the earth's magnetic field and the magnetic field at the compass location. { 'vī,brād·iŋ 'nēd·əl }

vibrating pebble mill [MECH ENG] A size-reduction device in which feed is ground by the action of vibrating, moving pebbles. { 'vī,brād·iŋ 'peb·əl ˌmil }

vibrating-reed electrometer [ENG] An instrument using a vibrating capacitor to measure a small charge, often in combination with an ionization chamber. { 'vī,brād·iŋ ¦rēd ˌi,lek'träm·əd·ər }

vibrating-reed frequency meter [ENG] A frequency meter consisting of steel reeds having different and known natural frequencies, all excited by an electromagnet carrying the alternating current whose frequency is to be measured. Also known as Frahm frequency meter; reed frequency meter; tuned-reed frequency meter. { 'vī,brād·iŋ ¦rēd 'frē·kwən·sē ˌmēd·ər }

vibrating-reed magnetometer [ENG] An instrument that measures magnetic fields by noting their effect on the vibration of reeds excited by an alternating magnetic field. { 'vī,brād·iŋ ¦rēd ˌmag·nə'täm·əd·ər }

vibrating-reed tachometer [ENG] A tachometer consisting of a group of reeds of different lengths, each having a specific natural frequency of vibration; observation of the vibrating reed when in contact with a moving mechanical device indicates the frequency of vibration for the device. { 'vī,brād·iŋ ¦rēd tə'käm·əd·ər }

vibrating screen [MECH ENG] A sizing screen which is vibrated by solenoid or magnetostriction, or mechanically by eccentrics or unbalanced spinning weights. { 'vī,brād·iŋ 'skrēn }

vibrating screen classifier [MECH ENG] A classifier whose screening surface is hung by rods and springs, and moves by means of electric vibrators. { 'vī,brād·iŋ ¦skrēn 'klas·ə,fī·ər }

vibrating wire transducer [ENG] A device for measuring ocean depth, consisting of a very fine tungsten wire stretched in a magnetic field so that it vibrates at a frequency that depends on the tension in the wire, and thereby on pressure and depth. { 'vī,brād·iŋ ¦wīr tranz'dü·sər }

vibration [MECH] A continuing periodic change in a displacement with respect to a fixed reference. { vī'brā·shən }

vibration damping [MECH ENG] The processes and techniques used for converting the mechanical vibrational energy of solids into heat energy. { vī'brā·shən 'damp·iŋ }

vibration drilling [MECH ENG] Drilling in which a frequency of vibration in the range of 100 to 20,000 hertz is used to fracture rock. { vī'brā·shən 'dril·iŋ }

vibration galvanometer [ENG] An alternating-current galvanometer in which the natural oscillation frequency of the moving element is equal to the frequency of the current being measured. { vī'brā·shən ˌgal·və'näm·əd·ər }

vibration isolation [ENG] The isolation, in structures, of those vibrations or motions that are classified as mechanical vibration; involves the control of the supporting structure, the placement and arrangement of isolators, and control of the internal construction of the equipment to be protected. { vī'brā·shən ˌī·sə'lā·shən }

vibration limit [CIV ENG] The amount of time during which fresh concrete remains mobile when subjected to vibration. { vī'brā·shən ˌlim·ət }

vibration machine [MECH ENG] A device for subjecting a system to controlled and reproducible mechanical vibration. Also known as shake table. { vī'brā·shən mə,shēn }

vibration magnetometer [ENG] An instrument that measures the period of vibration of a magnetic needle to determine the horizontal magnetic field strength at the needle. { vī'brā·shən ˌmag·nə'täm·əd·ər }

vibration meter *See* vibrometer. { vī'brā·shən ˌmēd·ər }

vibration puddling [CIV ENG] A technique used to achieve proper consolidation of concrete; vibrating machines may be drawn vertically through the cement, or used on the surface, or placed against the form holding the concrete in place. Also known as mechanical puddling. { vī'brā·shən 'pəd·liŋ }

vibration separation [MECH ENG] Classification or separation of grains of solids in which separation through a screen is expedited by vibration or oscillatory movement of the screening mediums. { vī'brā·shən ˌsep·ə'rā·shən }

vibration suppression [MECH ENG] The prevention of undesirable vibration, either through passive means such as damping or through active techniques involving feedback control. { vī'brā·shən sə,presh·ən }

vibrator [ELEC] An electromechanical device used primarily to convert direct current to alternating current but also used as a synchronous rectifier; it contains a vibrating reed which has a set of contacts that alternately hit stationary contacts attached to the frame, reversing the direction of current flow; the reed is activated

when a soft-iron slug at its tip is attracted to the pole piece of a driving coil. [MECH ENG] An instrument which produces mechanical oscillations. { 'vī,brād·ər }

vibratory centrifuge [MECH ENG] A high-speed rotating device to remove moisture from pulverized coal or other solids. { 'vī·brə,tůr·ē 'sen·trə,fyüj }

vibratory equipment [MECH ENG] Reciprocating or oscillating devices which move, shake, dump, compact, settle, tamp, pack, screen, or feed solids or slurries in process. { 'vī·brə,tȯr·ē i'kwip·mənt }

vibratory hammer [MECH ENG] A type of pile hammer which uses electrically activated eccentric cams to vibrate piles into place. { 'vī·brə,tȯr·ē 'ham·ər }

vibroenergy separator [MECH ENG] A screen-type device for classification or separation of grains of solids by a combination of gyratory motion and auxiliary vibration caused by balls bouncing against the lower surface of the screen cloth. { ¦vī·brō'en·ər·jē 'sep·ə,rād·ər }

vibrograph [ENG] An instrument that provides a complete oscillographic record of a mechanical vibration; in one form a moving stylus records the motion being measured on a moving paper or film. { 'vī·brə,graf }

vibrometer [ENG] An instrument designed to measure the amplitude of a vibration. Also known as vibration meter. { vī'bräm·əd·ər }

Vicat needle [ENG] An apparatus used to determine the setting time of cement by measuring the pressure of a special needle against the cement surface. { vē'kä ˌnēd·əl }

Victaulic coupling [DES ENG] A development in which a groove is cut around each end of pipe instead of the usual threads; two ends of pipe are then lined up and a rubber ring is fitted around the joint; two semicircular bands, forming a sleeve, are placed around the ring and are drawn together with two bolts, which have a ridge on both edges to fit into the groove of the pipe; as the bolts are tightened, the rubber ring is compressed, making a watertight joint, while the ridges fitting in the grooves make it strong mechanically. { vik'tȯl·ik 'kəp·liŋ }

videomagnetograph [ENG] A sensitive and accurate device for measuring the strength and sign of solar magnetic fields, using the signal that results when successive images in right- and left-circularly polarized light are subtracted; the images are taken in the wing of a spectral line, using a birefringent filter. { ˌvid·ē·ō·mag'ned·ə,graf }

virgin *See* straight-run. { 'vər·jən }

virial coefficients [THERMO] For a given temperature T, one of the coefficients in the expansion of P/RT in inverse powers of the molar volume, where P is the pressure and R is the gas constant. { 'vir·ē·əl ˌkō·i'fish·ənz }

Virmel engine [MECH ENG] A cat-and-mouse engine that employs vanelike pistons whose motion is controlled by a gear-and-crank system; each set of pistons stops and restarts when a chamber reaches the spark plug. { vər'mel ˌen·jən }

virtual acoustics [ENG ACOUS] Digitally processing sounds so that they appear to come from particular locations in three-dimensional space, with the goal of simulating the complex acoustic field experienced by a listener within a natural environment. Also known as auralization; three-dimensional sound. { ˌvər·chə·wəl ə'küs·tiks }

virtual displacement [MECH] **1.** Any change in the positions of the particles forming a mechanical system. **2.** An infinitesimal change in the positions of the particles forming a mechanical system, which is consistent with the geometrical constraints on the system. { 'vər·chə·wəl di'splās·mənt }

virtual entropy [THERMO] The entropy of a system, excluding that due to nuclear spin. Also known as practical entropy. { 'vər·chə·wəl 'en·trə·pē }

virtual leak [ENG] The semblance of the vacuum system leak caused by a gradual desorptive release of gas at a rate which cannot be accurately predicted. { 'vər·chə·wəl 'lēk }

virtual manufacturing [IND ENG] The modeling of manufacturing systems using audiovisual or other sensory features to simulate or design an actual manufacturing environment, or the prototyping and manufacture of a proposed product mainly through effective use of computers, used to predict potential problems and inefficiencies in product functionality and manufacturability before real manufacturing occurs. { ˌvər·chə·wəl ˌman·ə'fak·chər·iŋ }

virtual PPI reflectoscope [ENG] A device for superimposing a virtual image of a chart on a plan position indicator (PPI) pattern; the chart is usually prepared with white lines on a black background to the scale of the plan position indicator range scale. { 'vər·chə·wəl ¦pē¦pē'ī ri'flek·tə ˌskōp }

virtual work [MECH] The work done on a system during any displacement which is consistent with the constraints on the system. { 'vər·chə·wəl 'wərk }

virtual work principle *See* principle of virtual work. { 'vər·chə·wəl ¦wərk ˌprin·sə·pəl }

visbreaking *See* viscosity breaking. { 'vis,brāk·iŋ }

viscoelasticity [MECH] Property of a material which is viscous but which also exhibits certain elastic properties such as the ability to store energy of deformation, and in which the application of a stress gives rise to a strain that approaches its equilibrium value slowly. { ¦vis·kō,i,las'tis·əd·ē }

viscoelastic theory [MECH] The theory which attempts to specify the relationship between stress and strain in a material displaying viscoelasticity. { ¦vis·kō·i¦las·tik 'thē·ə·rē }

viscometer [ENG] An instrument designed to measure the viscosity of a fluid. { vi'skäm·əd·ər }

viscometer gage [ENG] A vacuum gage in

which the gas pressure is determined from the viscosity of the gas. { vi'skäm·əd·ər ˌgāj }

viscometry [ENG] A branch of rheology; the study of the behavior of fluids under conditions of internal shear; the technology of measuring viscosities of fluids. { vi'skäm·ə·trē }

viscose process [CHEM ENG] A process for the manufacture of rayon by treating cellulose with caustic soda, and with carbon disulfide to form cellulose xanthate, which is then dissolved in a weak caustic solution to form the viscose; fibers are used as silk substitutes. { 'visˌkōs ˌprä·səs }

viscosity blending chart [CHEM ENG] A graphical means for estimating the viscosity at a given temperature of a blend of petroleum products. { vi'skäs·əd·ē 'blend·iŋ ˌchärt }

viscosity breaking [CHEM ENG] A petroleum refinery process used to lower or break the viscosity of high-viscosity residuum by thermal cracking of molecules at relatively low temperatures. Also known as visbreaking. { vi'skäs·əd·ē 'brāk·iŋ }

viscosity conversion table [CHEM ENG] A table or chart with which kinematic viscosity, in centistokes, can be converted to Saybolt viscosity, in seconds, at the same temperature. { vi'skäs·əd·ē kən'vər·zhən ˌtā·bəl }

viscosity gage *See* molecular gage. { vi'skäs·əd·ē ˌgāj }

viscosity-gravity constant [CHEM ENG] An index of the chemical composition of crude oil; defined as the general relation between specific gravity and Saybolt Universal viscosity; the constant is low for paraffinic crude oils, high for naphthenic crude oils. Abbreviated VGC. { vi'skäs·əd·ē 'grav·əd·ē ˌkän·stənt }

viscosity index [CHEM ENG] An arbitrary scale used to show the magnitude of viscosity changes in lubricating oils with changes in temperature. Abbreviated VI. { vi'skäs·əd·ē ˌinˌdeks }

viscosity manometer *See* molecular gage. { viˌskäs·əd·ē mə'näm·əd·ē }

viscosity-temperature chart [CHEM ENG] A chart with which the kinematic or Saybolt viscosity of a petroleum oil at any temperature within a limited range may be ascertained, provided viscosities at two temperatures are known. { vi'skäs·əd·ē 'tem·prə·chər ˌchärt }

viscous damping [MECH ENG] A method of converting mechanical vibrational energy of a body into heat energy, in which a piston is attached to the body and is arranged to move through liquid or air in a cylinder or bellows that is attached to a support. { 'vis·kəs 'damp·iŋ }

viscous-drag gas-density meter [ENG] A device to measure gas-mixture densities; driven impellers in sample and standard chambers create measurable turbulences (drags) against respective nonrotating impellers. { 'vis·kəs ˌdrag ˌgas ˌden·səd·ē ˌmēd·ər }

viscous fillers [MECH ENG] A packaging machine that fills viscous product into cartons; there are two basic types, straight-line and rotary plunger; the former operates intermittently on a given number of containers, while the latter fills and discharges containers continuously. { 'vis·kəs 'fil·ərz }

viscous filter [ENG] An air-cleaning filter having a surface coated with a viscous liquid to trap particulates in the airstream. { ˌvis·kəs ˌfil·tər }

viscous impingement filter [ENG] A filter made up of a relatively loosely arranged medium, such that the airstream is forced to change direction frequently as it passes through the filter medium; the medium usually consists of spun-glass fibers, metal screens, or layers of crimped expanded metal whose surfaces are coated with a tacky oil. { 'vis·kəs im'pinj·mənt ˌfil·tər }

viscous lubrication *See* complete lubrication. { 'vis·kəs ˌlü·brə'kā·shən }

vise [DES ENG] A tool consisting of two jaws for holding a workpiece; opened and closed by a screw, lever, or cam mechanism. { vīs }

visibility meter [ENG] An instrument for making direct measurements of visual range in the atmosphere or of the physical characteristics of the atmosphere which determine the visual range. { ˌviz·ə'bil·əd·ē ˌmēd·ər }

vision light [BUILD] A viewing window set in a fire door, usually glazed with wire glass. { 'vizh·ən ˌlīt }

visual comparator *See* optical comparator. { 'vizh·ə·wəl kəm'par·əd·ər }

visual servoing [CONT SYS] The use of a solid-state camera on the end effector of a robot to provide feedback. { 'vizh·ə·wəl 'sər·vō·iŋ }

vitrification [ENG] Heat treatment of a material such as a ceramic to produce a glazed surface. { ˌvi·trə·fə'kā·shən }

vitrified wheel [DES ENG] A grinding wheel with a glassy or porcelanic bond. { 'vi·trəˌfīd 'wēl }

VIV *See* verbal information verification.

vixen file [DES ENG] A flat file with curved teeth; used for filing soft metals. { 'vik·sən ˌfīl }

V jewels [DES ENG] Jewel bearings used in conjunction with a conical pivot, the bearing surface being a small radius located at the apex of a conical recess; found primarily in electric measuring instruments. { 'vē ˌjülz }

VLSI circuit *See* very large scale integrated circuit. { ˌvēˌelˌesˌī 'sər·kət }

VMOS technology *See* vertical metal oxide semiconductor technology. { 'vēˌmäs tekˌnäl·ə·jē }

V-notch weir *See* triangular-notch weir. { 'vē ˌnäch 'wer }

VOC *See* volatile organic compounds.

voice coil [ENG ACOUS] The coil that is attached to the diaphragm of a moving-coil loudspeaker and moves through the air gap between the pole pieces due to interaction of the fixed magnetic field with that associated with the audio-frequency current flowing through the voice coil. Also known as loudspeaker voice coil; speech coil (British usage). { 'vȯis ˌkȯil }

voice print [ENG ACOUS] A voice spectrograph that has individually distinctive patterns of voice characteristics that can be used to identify one person's voice from other voice patterns. { 'vȯis ˌprint }

voice response [ENG ACOUS] The process of

generating an acoustic speech signal that communicates an intended message, such that a machine can respond to a request for information by talking to a human user. Also known as speech synthesis. { 'vȯis ri,spänes }

void channels [ENG] The open passages of a porous or packed medium through which liquid or gas can flow. { 'vȯid ˌchan·əlz }

Voigt body *See* Kelvin body. { 'fȯit ˌbäd·ē }

Voigt notation [MECH] A notation employed in the theory of elasticity in which elastic constants and elastic moduli are labeled by replacing the pairs of letters *xx*, *yy*, *zz*, *yz*, *zx*, and *xy* by the number 1, 2, 3, 4, 5, and 6 respectively. { 'fȯit nōˌtā·shən }

volatile organic compounds [ENG] Organic chemicals that produce vapors readily at room temperature and normal atmospheric pressure, including gasoline and solvents such as toluene, xylene, and tetrachloroethylene. They form photochemical oxidants (including ground-level ozone) that affect health, damage materials, and cause crop and forest losses. Many are also hazardous air pollutants. Abbreviated VOC. { ˌväl·ə·təl ȯrˌgan·ik 'kämˌpaůnz }

volatility [THERMO] The quality of having a low boiling point or subliming temperature at ordinary pressure or, equivalently, of having a high vapor pressure at ordinary temperatures. { ˌväl·əˈtil·əd·ē }

volatilization [THERMO] The conversion of a chemical substance from a liquid or solid state to a gaseous or vapor state by the application of heat, by reducing pressure, or by a combination of these processes. Also known as vaporization. { ˌväl·əd·əl·əˈzā·shən }

volley [ENG] A round of holes fired at any one time. { 'väl·ē }

volt [ELEC] The unit of potential difference or electromotive force in the meter-kilogram-second system, equal to the potential difference between two points for which 1 coulomb of electricity will do 1 joule of work in going from one point to the other. Symbolized V. { vōlt }

Volta effect *See* contact potential difference. { 'vōl·tə iˌfekt }

voltage [ELEC] Potential difference or electromotive force measured in volts. { 'vōl·tij }

voltage amplification [ELECTR] The ratio of the magnitude of the voltage across a specified load impedance to the magnitude of the input voltage of the amplifier or other transducer feeding that load; often expressed in decibels by multiplying the common logarithm of the ratio by 20. { 'vōl·tij ˌam·plə·fəˈkā·shən }

voltage amplifier [ELECTR] An amplifier designed primarily to build up the voltage of a signal, without supplying appreciable power. { 'vōl·tij 'am·pləˌfī·ər }

voltage coefficient [ELEC] For a resistor whose resistance varies with voltage, the ratio of the fractional change in resistance to the change in voltage. { 'vōl·tij ˌkō·iˌfish·ənt }

voltage-current dual [ELEC] A pair of circuits in which the elements of one circuit are replaced by their dual elements in the other circuit according to the duality principle; for example, currents are replaced by voltages, capacitances by resistances. { 'vōl·tij 'kə·rənt 'dül }

voltage-dependent resistor *See* varistor. { 'vōl·tij diˌpen·dənt riˈzis·tər }

voltage drop [ELEC] The voltage developed across a component or conductor by the flow of current through the resistance or impedance of that component or conductor. { 'vōl·tij ˌdräp }

voltage gain [ELECTR] The difference between the output signal voltage level in decibels and the input signal voltage level in decibels; this value is equal to 20 times the common logarithm of the ratio of the output voltage to the input voltage. { 'vōl·tij ˌgān }

voltage generator [ELECTR] A two-terminal circuit element in which the terminal voltage is independent of the current through the element. { 'vōl·tij ˌjen·əˌrād·ər }

voltage gradient [ELEC] The voltage per unit length along a resistor or other conductive path. { 'vōl·tij ˌgrād·ē·ənt }

voltage level [ELEC] At any point in a transmission system, the ratio of the voltage existing at that point to an arbitrary value of voltage used as a reference. { 'vōl·tij ˌlev·əl }

voltage measurement [ELEC] Determination of the difference in electrostatic potential between two points. { 'vōl·tij ˌmezh·ər·mənt }

voltage multiplier [ELEC] *See* instrument multiplier. [ELECTR] A rectifier circuit capable of supplying a direct-current output voltage that is two or more times the peak value of the alternating-current voltage. { 'vōl·tij ˌməl·təˌplī·ər }

voltage-multiplier circuit [ELEC] A rectifier circuit capable of supplying a direct-current output voltage that is two or more times the peak value of the alternating-current input voltage; useful for high-voltage, low-current supplies. { 'vōl·tij ˈməl·təˌplī·ər ˌsər·kət }

voltage phasor [ELEC] A line whose length represents the magnitude of a sinusoidally varying voltage and whose angle with the positive *x*-axis represents its phase. { 'vōl·tij ˌfā·zər }

voltage quadrupler [ELECTR] A rectifier circuit, containing four diodes, which supplies a direct-current output voltage which is four times the peak value of the alternating-current input voltage. { 'vōl·tij kwäˌdrüp·lər }

voltage rating [ELEC] The maximum sustained voltage that can safely be applied to an electric device without risking the possibility of electric breakdown. Also known as working voltage. { 'vōl·tij ˌrād·iŋ }

voltage ratio [ELEC] The root-mean-square primary terminal voltage of a transformer divided by the root-mean-square secondary terminal voltage under a specified load. { 'vōl·tij ˌrā·shō }

voltage regulation [ELEC] The ratio of the difference between no-load and full-load output voltage of a device to the full-load output voltage, expressed as a percentage. { 'vōl·tij ˌreg·yəˌlā·shən }

voltage regulator [ELECTR] A device that maintains the terminal voltage of a generator or other voltage source within required limits despite variations in input voltage or load. Also known as automatic voltage regulator; voltage stabilizer. { 'vōl·tij ˌreg·yəˌlād·ər }

voltage-regulator diode [ELECTR] A diode that maintains an essentially constant direct voltage in a circuit despite changes in line voltage or load. { 'vōl·tij ˌreg·yəˌlād·ər ˌdīˌōd }

voltage stabilizer *See* voltage regulator. { 'vōl·tij ˌstā·bəˌlīz·ər }

voltage transformer [ELEC] An instrument transformer whose primary winding is connected in parallel with a circuit in which the voltage is to be measured or controlled. Also known as potential transformer. { 'vōl·tij tranzˌfȯr·mər }

voltage-variable capacitor *See* varactor. { 'vōl·tij ¦ver·ē·əbəl kə'pas·əd·ər }

voltaic cell [ELEC] A primary cell consisting of two dissimilar metal electrodes in a solution that acts chemically on one or both of them to produce a voltage. { vōl'tā·ik 'sel }

voltammeter [ELEC] An instrument that may be used either as a voltmeter or ammeter. { väl 'tam·əd·ər }

volt-ampere [ELEC] The unit of apparent power in the International System; it is equal to the apparent power in a circuit when the product of the root-mean-square value of the voltage, expressed in volts, and the root-mean-square value of the current, expressed in amperes, equals 1. Abbreviated VA. { 'vōlt 'amˌpir }

volt-ampere hour [ELEC] A unit for expressing the integral of apparent power over time, equal to the product of 1 volt-ampere and 1 hour, or to 3600 joules. { 'vōlt 'amˌpir 'aůr }

volt-ampere-hour reactive *See* var hour. { 'vōlt 'amˌpir 'aůr rē'ak·tiv }

volt-ampere reactive [ELEC] The unit of reactive power in the International System; it is equal to the reactive power in a circuit carrying a sinusoidal current when the product of the root-mean-square value of the voltage, expressed in volts, by the root-mean-square value of the current, expressed in amperes, and by the sine of the phase angle between the voltage and the current, equals 1. Abbreviated var. Also known as reactive volt-ampere. { 'vōlt 'amˌpir rē'ak·tiv }

voltmeter [ENG] An instrument for the measurement of potential difference between two points, in volts or in related smaller or larger units. { 'vōltˌmēd·ər }

voltmeter-ammeter [ENG] A voltmeter and an ammeter combined in a single case but having separate terminals. { 'vōltˌmēd·ər 'amˌēd·ər }

volt-ohm-milliammeter [ENG] A test instrument having a number of different ranges for measuring voltage, current, and resistance. Also known as circuit analyzer; multimeter; multiple-purpose tester. { 'vōlt 'ōm ¦mil·ē'am ˌēd·ər }

volume [ENG ACOUS] The magnitude of a complex audio-frequency current as measured in volume units on a standard volume indicator. { 'väl·yəm }

volume compressor [ENG ACOUS] An audio-frequency circuit that limits the volume range of a radio program at the transmitter, to permit using a higher average percent modulation without risk of overmodulation; also used when making disk recordings, to permit a closer groove spacing without overcutting. Also known as automatic volume compressor. { 'väl·yəm kəm ˌpres·ər }

volume control [ENG ACOUS] A potentiometer used to vary the loudness of a reproduced sound by varying the audio-frequency signal voltage at the input of the audio amplifier. { 'väl·yəm kənˌtrōl }

volume control system [ENG ACOUS] An electronic system that regulates the signal amplification or limits the output of a circuit, such as a volume compressor or a volume expander. { 'väl·yəm kənˌtrōl ˌsis·təm }

volume expander [ENG ACOUS] An audio-frequency control circuit sometimes used to increase the volume range of a radio program or recording by making weak sounds weaker and loud sounds louder; the expander counteracts volume compression at the transmitter or recording studio. Also known as automatic volume expander. { 'väl·yəm ikˌspan·dər }

volume indicator [ENG ACOUS] A standardized instrument for indicating the volume of a complex electric wave such as that corresponding to speech or music; the reading in volume units is equal to the number of decibels above a reference level which is realized when the instrument is connected across a 600-ohm resistor that is dissipating a power of 1 milliwatt at 100 hertz. Also known as volume unit meter. { 'väl·yəm ˌin·dəˌkād·ər }

volume meter [ENG] Any flowmeter in which the actual flow is determined by the measurement of a phenomenon associated with the flow. { 'väl·yəm ˌmēd·ər }

volumenometer [ENG] An instrument for determining the volume of a body by measuring the pressure in a closed air space when the specimen is present and when it is absent. { välˌyü·mə'näm·əd·ər }

volume range [ELEC] In a transmission system, the difference, expressed in decibels, between the maximum and minimum volumes that can be satisfactorily handled by the system. [ENG ACOUS] The difference, expressed in decibels, between the maximum and minimum volumes of a complex audio-frequency signal occurring over a specified period of time. { 'väl·yəm ˌrānj }

volume resistivity [ELEC] Electrical resistance between opposite faces of a 1-centimeter cube of insulating material, commonly expressed in ohm-centimeters. Also known as specific insulation resistance. { 'väl·yəm ˌrēˌzis'tiv·əd·ē }

volumeter [ENG] Any instrument for measuring

volumes of gases, liquids, or solids. { 'väl·yə,mēd·ər }

volumetric efficiency [MECH ENG] In describing an engine or gas compressor, the ratio of volume of working substance actually admitted, measured at a specified temperature and pressure, to the full piston displacement volume; for a liquid-fuel engine, such as a diesel engine, volumetric efficiency is the ratio of the volume of air drawn into a cylinder to the piston displacement. { ¦väl·yə¦me·trik i'fish·ən·sē }

volumetric radar [ENG] Radar capable of producing three-dimensional position data on a multiplicity of targets. { ¦väl·yə¦me·trik 'rā,där }

volumetric strain [MECH] One measure of deformation; the change of volume per unit of volume. { ¦väl·yə¦me·trik 'strān }

volume unit [ENG ACOUS] A unit for expressing the audio-frequency power level of a complex electric wave, such as that corresponding to speech or music; the power level in volume units is equal to the number of decibels above a reference level of 1 milliwatt as measured with a standard volume indicator. Abbreviated VU. { 'väl·yəm ,yü·nət }

volume unit meter *See* volume indicator. { 'väl·yəm ,yü·nət ,mēd·ər }

volute [DES ENG] A spiral casing for a centrifugal pump or a fan designed so that speed will be converted to pressure without shock. { və'lüt }

volute pump [MECH ENG] A centrifugal pump housed in a spiral casing. { və'lüt 'pəmp }

von Arx current meter [ENG] A type of current-measuring device using electromagnetic induction to determine speed and, in some models, direction of deep-sea currents. { fón 'ärks 'kə·rənt ,mēd·ər }

von Mises yield criterion [MECH] The assumption that plastic deformation of a material begins when the sum of the squares of the principal components of the deviatoric stress reaches a certain critical value. { fón ¦mēz·əz 'yēld ,krī,tir·ē·ən }

Vorce diaphragm cell [CHEM ENG] A cylindrical cell with graphite anodes and asbestos-covered cathode, used in the electrolytic process for the manufacture of chlorine. { 'vȯrs 'dī·ə,fram ,sel }

vortex amplifier [ENG] A fluidic device in which the supply flow is introduced at the circumference of a shallow cylindrical chamber; the vortex field developed can substantially reduce or throttle flow; used in fluidic diodes, throttles, pressure amplifiers, and a rate sensor. { 'vȯr,teks 'am·plə,fī·ər }

vortex burner [ENG] Combustion device in which the combustion air is fed tangentially into the burner, creating a spin (vortex) to mix it with the fuel as it is injected. { 'vȯr,teks 'bər·nər }

vortex cage meter [ENG] In flow measurement, a type of quantity meter which exerts only a slight retardation on the flowing fluid; the elements rotate at a speed that is linear with fluid velocity; revolutions are counted either by coupling to a local mounted counter or by a proximity detector for remote transmission. { 'vȯr,teks 'kāj ,mēd·ər }

vortex precession flowmeter [ENG] An instrument for measuring gas flows from the rate of precession of vortices generated by a fixed set of radial vanes placed in the flow. Also known as swirl flowmeter. { 'vȯr,teks prē'sesh·ən 'flō ,mēd·ər }

vortex-shedding meter [ENG] A flowmeter in which fluid velocity is determined from the frequency at which vortices are generated by an obstruction in the flow. { 'vȯr,teks ¦shed·iŋ ,mēd·ər }

vortex thermometer [ENG] A thermometer, used in aircraft, which automatically corrects for adiabatic and frictional temperature rises by imparting a rotary motion to the air passing the thermal sensing element. { 'vȯr,teks thər'mäm·əd·ər }

VOS *See* vertical obstacle sonar.

V-tool *See* parting tool. { 'vē,tül }

VTVM *See* vacuum-tube voltmeter.

v-type engine [MECH ENG] An engine in which the cylinders are arranged in two rows set at an angle to each other, with the crankshaft running through the point of a V. { 'vē ,tīp ,en·jən }

vulcanization [CHEM ENG] A chemical reaction of sulfur (or other vulcanizing agent) with rubber or plastic to cause cross-linking of the polymer chains; it increases strength and resiliency of the polymer. Also known as cure. { ,vəl·kə·nə 'zā·shən }

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W

Wacker process [CHEM ENG] A process for the oxidation of ethylene to acetaldehyde by oxygen in the presence of palladium chloride and cupric chloride. { 'wak·ər ˌprä·səs }

wafer [ELECTR] A thin semiconductor slice on which matrices of microcircuits can be fabricated, or which can be cut into individual dice for fabricating single transistors and diodes. [ENG] A flat element for a process unit, as in a series of stacked filter elements. { 'wā·fər }

wage curve [IND ENG] A graphic representation of the relationship between wage rates and point values for key jobs. { 'wāj ˌkərv }

wage incentive plan [IND ENG] A wage system which provides additional pay for qualitative and quantitative performance which exceeds standard or normal levels. Also known as incentive wage system. { 'wāj in'sen·tiv ˌplan }

wagon drill [MECH ENG] **1.** A vertically mounted, pneumatic, percussive-type rock drill supported on a three- or four-wheeled wagon. **2.** A wheel-mounted diamond drill machine. { 'wag·ən ˌdril }

wainscot [BUILD] A decorative or protective panel installed over the lower portion of an interior partition or wall. { 'wānz·kət }

waist [ENG] The center portion of a vessel or container that has a smaller cross section than the adjacent areas. { wāst }

wait [CONT SYS] Cessation of motion of a robot manipulator, under computer control, until further notice. { wāt }

waiting line [IND ENG] A line formed by units waiting for service. Also known as queue. { 'wād·iŋ ˌlīn }

wale *See* waler. { wāl }

waler [CIV ENG] A horizontal reinforcement utilized to keep newly poured concrete forms from bulging outward. Also spelled whaler. Also known as wale. { 'wā·lər }

walking beam [MECH ENG] A lever that oscillates on a pivot and transmits power in a manner producing a reciprocating or reversible motion; used in rock drilling and oil well pumping. { 'wȯk·iŋ ˌbēm }

walking dragline [MECH ENG] A large-capacity dragline built with moving feet; disks 20 feet (6 meters) in diameter support the excavator while working. { 'wȯk·iŋ 'dragˌlīn }

walking machine [MECH ENG] A machine designed to carry its operator over various types of terrain; the operator sits on a platform carried on four mechanical legs, and movements of his arms control the front legs of the machine while movements of his legs control the rear legs of the machine. { 'wȯk·iŋ mə·shēn }

walkthrough method [CONT SYS] The instruction of a robot by taking it through its sequences of motions, so that these actions are stored in its memory and recalled when necessary. { 'wȯkˌthrü ˌmeth·əd }

wall [ENG] A vertical structure or member forming an enclosure or defining a space. { wȯl }

wall anchor [BUILD] A steel strap fastened to the end of every second or third common joist and built into the brickwork of a wall to provide lateral support. Also known as joist anchor. { 'wȯl ˌaŋ·kər }

wall box [BUILD] **1.** A frame or box set into a wall to receive a beam or joist. Also known as beam box; wall frame. **2.** A frame set into a wall to provide a sealed space for pipework to pass through. [ELEC] A metal box set into a wall to hold switches, receptacles, or similar electrical wiring components. { 'wȯl ˌbäks }

wall coping [CIV ENG] The covering course on top of a brick or stone wall. { 'wȯl ˌkōp·iŋ }

wall crane [MECH ENG] A jib crane mounted on a wall. { 'wȯl ˌkrān }

Walley engine [MECH ENG] A multirotor engine employing four approximately elliptical rotors that turn in the same clockwise sense, leading to excessively high rubbing velocities. { 'wäl·ē ˌen·jən }

wall frame *See* wall box. { 'wȯl ˌfrām }

wall furnace [MECH ENG] A self-contained vented furnace that is permanently attached to a wall and provides heated air directly to the surrounding space. { 'wȯl ˌfər·nəs }

wall grille [BUILD] A perforated plate or a framed structure composed of rods or bars that is used to cover a wall opening to restrict vision but allow movement of air. { 'wȯl ˌgril }

wall guard [BUILD] A protective strip of resilient material applied to the surface of a wall (especially along a corridor) several feet off the floor to prevent damage by vehicles used within a building. { 'wȯl ˌgärd }

wall hanger [BUILD] A bracket installed in a masonry wall to support the end of a horizontal member. { 'wȯl ˌhaŋ·ər }

wall off [ENG] To seal cracks or crevices in the wall of a borehole with cement, mud cake, compacted cuttings, or casing. { 'wȯl 'ȯf }

wall plate [BUILD] A piece of timber laid flat along the tip of the wall; it supports the rafters. Also known as raising plate. { 'wȯl ˌplāt }

wall ratio [DES ENG] Ratio of the outside radius of a gun, a tube, or jacket to the inside radius; or ratio of the corresponding diameters. { 'wȯl ˌrā·shō }

wall spacer [CIV ENG] A metal tie that holds a form for poured concrete in position until the concrete has set. { 'wȯl ˌspās·ər }

wall superheat [THERMO] The difference between the temperature of a surface and the saturation temperature (boiling point at the ambient pressure) of an adjacent liquid that is heated by the surface. { ¦wȯl 'sü·pərˌhēt }

wall tie [BUILD] A rigid, corrosion-resistant metal tie fitted into the bed joints across the cavity of a cavity wall. { 'wȯl ˌtī }

Walter engine [MECH ENG] A multirotor rotary engine that uses two different-sized elliptical rotors. { 'wȯl·tər ˌen·jən }

Wankel engine [MECH ENG] An eccentric-rotor-type internal combustion engine with only two primary moving parts, the rotor and the eccentric shaft; the rotor moves in one direction around the trochoidal chamber containing peripheral intake and exhaust ports. Also known as rotary-combustion engine. { 'väŋ·kəl ˌen·jən }

Wanner optical pyrometer [ENG] A type of polarizing pyrometer in which beams from the source under investigation and a comparison lamp are polarized at right angles and then passed through a Nicol prism and a red filter; the source temperature is determined from the angle through which the Nicol prism must be rotated in order to equalize the intensities of the resulting patches of light. { ¦wän·ər ¦äp·tə·kəl pī'räm·əd·ər }

Ward-Leonard speed-control system [CONT SYS] A system for controlling the speed of a direct-current motor in which the armature voltage of a separately excited direct-current motor is controlled by a motor-generator set. { 'wȯrd 'len·ərd 'spēd kən¦trōl ˌsis·təm }

warehouse [IND ENG] A building used for storing merchandise and commodities. { 'wer ˌhaůs }

warm-air heating [MECH ENG] Heating by circulating warm air; system contains a direct-fired furnace surrounded by a bonnet through which air circulates to be heated. { 'wȯrm ¦er 'hēd·iŋ }

warm-up time [ENG] A span of time between the first application of power to a system and the moment when the system can function fully. { 'wȯrmˌəp ˌtīm }

warning pipe [ENG] An overflow pipe with a conspicuous outlet permitting prompt observation of discharge. { 'wȯrn·iŋ ˌpīp }

warpage [MECH] The action, process, or result of twisting or turning out of shape. { 'wȯr·pij }

warping function *See* torsion function. { 'wȯrp·iŋ ˌfəŋk·shən }

Warren truss [CIV ENG] A truss having only sloping members between the top and bottom horizontal members. { 'wär·ən ˌtrəs }

wash [BUILD] Any member that serves to carry water away from a section of a structure. [ENG] **1.** To clean cuttings or other fragmental rock materials out of a borehole by the jetting and buoyant action of a copious flow of water or a mud-laden liquid. **2.** The erosion of core or drill string equipment by the action of a rapidly flowing stream of water or mud-laden drill-circulation liquid. { wäsh }

washboard course [ENG] A test course for vehicles consisting of a series of waves or convolutions having arbitrary amplitude and frequency; a common type is the so-called sine-wave course. { 'wäshˌbȯrd ˌkȯrs }

wash boring *See* jet drilling. { 'wäsh ˌbȯr·iŋ }

wash coat [ENG] A sealer consisting of a very thin, semitransparent coat of paint. { 'wäsh ˌkōt }

washer [DES ENG] A flattened, ring-shaped device used to improve the tightness of a screw fastener. [ENG] **1.** A device for removing dirt and soluble impurities from pulp and paper stock. **2.** A system for washing photographic materials to remove soluble products of developing or fixing. **3.** A power-driven machine for washing clothes and household linens. Also known as washing machine. **4.** *See* scrubber. { 'wäsh·ər }

washing [CHEM ENG] In a process operation, cleaning of a solids bed (settler) or cake (filter) with a liquid in which the solid is not soluble. { 'wäsh·iŋ }

washing machine *See* washer. { 'wäsh·iŋ məˌshēn }

washout [ENG] **1.** An overlarge well bore caused by the solvent and erosional action of drilling fluid. **2.** A fluid-cut opening resulting from leaking fluid. { 'wäshˌaůt }

wash water [CHEM ENG] Water contacted with process streams (liquid or gas), packed beds, or filter cakes to flush or dissolve out impurities. { 'wäsh ˌwȯd·ər }

waste [ENG] **1.** Rubbish from a building. **2.** Dirty water from mining, industrial, and domestic use. **3.** The amount of excavated material exceeding fill. { wāst }

waste heat [ENG] Sensible heat in gases not subject to combustion and used for processes downstream in a system. { 'wāst 'hēt }

waste-heat boiler [CHEM ENG] A heat-retrieval unit using hot by-product gas or oil from chemical processes; used to produce steam in a boiler-type system. Also known as gas-tube boiler. { 'wāst ¦hēt 'bȯi·lər }

waste lubrication [ENG] A method in which a lubricant is delivered to a bearing surface by the wicking action of cloth waste or yarn. { 'wāst ˌlü·brə¦kā·shən }

waste pipe [CIV ENG] A pipe to carry waste water from a basin, bath, or sink in a building. { 'wāst ˌpīp }

waste vent *See* stack vent. { 'wāst ˌvent }

watchdog timer [CONT SYS] In a flexible manufacturing system, a safety device in the form of a control interface on an automated guided vehicle that shuts down part or all of the system under certain conditions. { 'wächˌdȯg ˌtīm·ər }

water bar [BUILD] A strip of material attached to the sill of a window or external door to prevent penetration by water. Also known as weather bar. { 'wȯd·ər ˌbär }

water brake [ENG] An absorption dynamometer for measuring power output of an engine shaft; the mechanical energy is converted to heat in a centrifugal pump, with a free casing where turning moment is measured. { 'wȯd·ər ˌbrāk }

water calorimeter [ENG] A calorimeter that measures radio-frequency power in terms of the rise in temperature of water in which the r-f energy is absorbed. { 'wȯd·ər ˌkal·ə'rim·əd·ər }

water column [MECH ENG] A tubular column located at the steam and water space of a boiler to which protective devices such as gage cocks, water gage, and level alarms are attached. { 'wȯd·ər ˌkäl·əm }

water-cooled condenser [MECH ENG] A steam condenser which is for the maintenance of vacuum, and in which water is the heat-receiving fluid. { 'wȯd·ər ¦küld kən'den·sər }

water-cooled furnace [MECH ENG] A fuel-fired furnace containing tubes in which water is circulated to limit heat loss to the surroundings, control furnace temperature, and generate steam. { 'wȯd·ər ¦küld 'fər·nəs }

water cooling [ELECTR] Cooling the electrodes of an electron tube by circulating water through or around them. [ENG] Cooling in which the primary coolant is water. { 'wȯd·ər ˌkül·iŋ }

water demineralizing [CHEM ENG] The removal of minerals (for example, compounds of Ca, Mg, and Na) from water by chemical, ion-exchange, or distillation procedures. { 'wȯd·ər dē'min·rəˌlīz·iŋ }

water-flow pyrheliometer [ENG] An absolute pyrheliometer, in which the radiation-sensing element is a blackened, water calorimeter; it consists of a cylinder, blackened on the interior, and surrounded by a special chamber through which water flows at a constant rate; the temperatures of the incoming and outgoing water, which are monitored continuously by thermometers, are used to compute the intensity of the radiation. { 'wȯd·ər ¦flō ¦pirˌhē·lē'äm·əd·ər }

water gage [ENG] A gage glass with attached fittings which indicates water level in a vessel. { 'wȯd·ər ˌgāj }

water-gas reaction [CHEM ENG] A method used to prepare carbon monoxide by passing steam over hot coke or coal at 600–1000°C. { 'wȯd·ər ¦gas rēˌak·shən }

water heater [MECH ENG] A tank for heating and storing hot water for domestic use. { 'wȯd·ər ˌhēd·ər }

water jacket [ENG] A casing for circulation of cooling water. { 'wȯd·ər ˌjak·ət }

water-jet cutting [ENG] A machining method that uses a jet of pressurized water containing abrasive powder for cutting steel and other dense materials. { 'wȯd·ər ˌjet ˌkəd·iŋ }

water joint [CIV ENG] A joint in a stone pavement containing stones that are set slightly higher to prevent water from settling in the joint. { 'wȯd·ər ˌjȯint }

water leg [ENG] The vertical area of a vessel or accessory to a vessel for the collection of water. Also known as sump. { 'wȯd·ər ˌleg }

water main [CIV ENG] The water pipe in a street from which water is delivered to individual service pipes supplying domestic property. { 'wȯd·ər ˌmān }

water meter [ENG] An instrument for measuring the amount of water passing a specified point in a piping system. { 'wȯd·ər ˌmēd·ər }

water path [ENG] In ultrasonic testing, distance from an ultrasonic search unit to the test piece in an immersion or water column examination. { 'wȯd·ər ˌpath }

waterpower [MECH] Power, usually electric, generated from an elevated water supply by the use of hydraulic turbines. { 'wȯd·ərˌpaü·ər }

waterproof [ENG] Impervious to water. { 'wȯd·ərˌprüf }

water purification [CIV ENG] Any of several processes in which undesirable impurities in water are removed or neutralized; for example, chlorination, filtration, primary treatment, ion exchange, and distillation. { 'wȯd·ər ˌpyůr·ə·fə'kā·shən }

water right [ENG] The right to use water for mining, agricultural, or other purposes. { 'wȯd·ər ˌrīt }

water sample [ENG] A portion of water brought up from a depth to determine its composition. { 'wȯd·ər ˌsam·pəl }

water scrubber [CHEM ENG] A device or system in which gases are contacted with water (either by spray or bubbling through) to wash out traces of water-soluble components of the gas stream. { 'wȯd·ər ˌskrəb·ər }

water seal [ENG] A seal formed by water to prevent the passage of gas. { 'wȯd·ər ˌsēl }

water-sealed holder [ENG] A low-pressure gas holder which consists of cylindrical sections or lifts telescoping into a pit or tank filled with water; the inside section is closed in on top. { 'wȯd·ər ¦sēld 'hōl·dər }

waterspout [ENG] A pipe or orifice through which water is discharged or by which it is conveyed. { 'wȯd·ərˌspaůt }

water-supply engineering [CIV ENG] A branch of civil engineering concerned with the development of sources of supply, transmission, distribution, and treatment of water. { 'wȯd·ər səˌplī ˌen·jə'nir·iŋ }

water swivel [DES ENG] A device connecting the water hose to the drill-rod string and designed to permit the drill string to be rotated in the borehole while water is pumped into it to create

the circulation needed to cool the bit and remove the cuttings produced. Also known as gooseneck; swivel neck. { 'wȯd·ər ˌswiv·əl }

water table [BUILD] A ledge or slight projection of the masonry or wood construction on the exterior of a foundation wall, or just above it, to protect the foundation by directing rainwater away from the wall. Also known as canting strip. { 'wȯd·ər ˌtā·bəl }

water tower [CIV ENG] A tower or standpipe for storing water in areas where ordinary water pressure is inadequate for distribution to consumers. { 'wȯd·ər ˌtaú·ər }

water treatment [CIV ENG] Purification of water to make it suitable for drinking or for any other use. { 'wȯd·ər ˌtrēt·mənt }

water-tube boiler [MECH ENG] A steam boiler in which water circulates within tubes and heat is applied from outside the tubes to generate steam. { 'wȯd·ər ˈtüb ˌbȯi·lər }

water tunnel [CIV ENG] A tunnel to transport water in a water-supply system. { 'wȯd·ər ˌtən·əl }

waterwall [MECH ENG] The side of a boiler furnace consisting of water-carrying tubes which absorb radiant heat and thereby prevent excessively high furnace temperatures. { 'wȯd·ərˌwȯl }

waterway [CIV ENG] A channel for the escape or passage of water. { 'wȯd·ərˌwā }

water well [CIV ENG] A well sunk to extract water from a zone of saturation. { 'wȯd·ər ˌwel }

waterwheel [MECH ENG] A vertical wheel on a horizontal shaft that is made to revolve by the action or weight of water on or in containers attached to the rim. { 'wȯd·ərˌwēl }

waterworks [CIV ENG] The whole system of supply and treatment utilized in acquisition and distribution of water to consumers. { 'wȯd·ər ˌwərks }

Watson factor *See* characterization factor. { 'wät·sən ˌfak·tər }

watt-hour [ELEC] A unit of energy used in electrical measurements, equal to the energy converted or consumed at a rate of 1 watt during a period of 1 hour, or to 3600 joules. Abbreviated Wh. { 'wät ˈaůr }

watt-hour meter [ENG] A meter that measures and registers the integral, with respect to time, of the active power of the circuit in which it is connected; the unit of measurement is usually the kilowatt-hour. { 'wät ˈaůr ˌmēd·ər }

wattmeter [ENG] An instrument that measures electric power in watts ordinarily. { 'wätˌmēd·ər }

Watt's law [THERMO] A law which states that the sum of the latent heat of steam at any temperature of generation and the heat required to raise water from 0°C to that temperature is constant; it has been shown to be substantially in error. { 'wäts ˌlȯ }

wave filter [ELEC] A transducer for separating waves on the basis of their frequency; it introduces relatively small insertion loss to waves in one or more frequency bands and relatively large insertion loss to waves of other frequencies. { 'wāv ˌfil·tər }

wave gage [ENG] A device for measuring the height and period of waves. { 'wāv ˌgāj }

wave gait [MECH ENG] A mode of motion of a mobile robot with several legs in which its components have a wavy motion. { 'wāv ˌgāt }

waveguide junction *See* junction. { 'wāvˌgīd ˈjəŋk·shən }

waveguide synthesis [ENG ACOUS] A method of synthesizing the sounds of a string or wind instrument that simulates traveling waves on a string or inside a bore or horn using digital delay lines. { ˌwāvˌgīd 'sin·thə·səs }

wavemeter [ENG] A device for measuring the geometrical spacing between successive surfaces of equal phase in an electromagnetic wave. { 'wāvˌmēd·ər }

wave microphone [ENG ACOUS] Any microphone whose directivity depends upon some type of wave interference, such as a line microphone or a reflector microphone. { 'wāv 'mī·krəˌfōn }

wave motor [MECH ENG] A motor that depends on the lifting power of sea waves to develop its usable energy. { 'wāv ˌmōd·ər }

wave noise [ELECTR] Noise in the electric current of a detector that results from fluctuations in the intensity of electromagnetic radiation falling on the detector. { 'wāv ˌnȯiz }

wave polarization *See* polarization. { 'wāv ˌpō·lə·rəˌzā·shən }

wave shaper [ENG] Of explosives, an insert or core of inert material or of explosives having different detonation rates, used for changing the shape of the detonation wave. { 'wāv ˌshāp·ər }

wave-shaping circuit [ELECTR] An electronic circuit used to create or modify a specified time-varying electrical quantity, usually voltage or current, using combinations of electronic devices, such as vacuum tubes or transistors, and circuit elements, including resistors, capacitors, and inductors. { 'wāv ˈshāp·iŋ ˌsər·kət }

wave soldering *See* flow soldering. { 'wāv ˌsäd·ə·riŋ }

wave tail [ELECTR] Part of a signal-wave envelope (in time or distance) between the steady-state value (or crest) and the end of the envelope. { 'wāv ˌtāl }

wave trap [CIV ENG] A device used to reduce the size of waves from sea or swell entering a harbor before they penetrate as far as the quayage; usually in the form of diverging breakwaters, or small projecting breakwaters situated close within the entrance. [ELECTR] A resonant circuit connected to the antenna system of a receiver to suppress signals at a particular frequency, such as that of a powerful local station that is interfering with reception of other stations. Also known as trap. { 'wāv ˌtrap }

wax fractionation [CHEM ENG] A continuous solvent-recovery/crystallization petroleum-refinery process for the production of waxes with low oil content from wax concentrates; for example,

MEK (methyl ethyl ketone) deoiling. { 'waks ˌfrak·shə'nā·shən }

wax manufacturing [CHEM ENG] A petroleum refinery process similar to wax fractionation for the manufacture of oil-free waxes by chilling and crystallization from a solvent. { 'waks ˌman·ə'fak·chə·riŋ }

wax master *See* wax original. { 'waks 'mas·tər }

wax original [ENG ACOUS] An original recording made on a wax surface and used to make a master. Also known as wax master. { 'waks ə'rij·ən·əl }

way point *See* via point. { 'wā ˌpȯint }

ways [CIV ENG] **1.** The tracks and sliding timbers used in launching a vessel. **2.** The building slip or space upon which the sliding timbers or ways, supporting a vessel to be launched, travel. [MECH ENG] Bearing surfaces used to guide and support moving parts of machine tools; may be flat, V-shaped, or dovetailed. { wāz }

wear [ENG] Deterioration of a surface due to material removal caused by relative motion between it and another part. { wer }

wearing course [CIV ENG] The top layer of surfacing on a road. { 'wer·iŋ ˌkȯrs }

weather bar *See* water bar. { 'weth·ər ˌbär }

weathered joint *See* weather-struck joint. { ˌweth·ərd ˈjȯint }

weather observation radar *See* weather radar. { 'weth·ər ˌäb·zərˌvā·shən 'rāˌdär }

weatherometer [ENG] A device used to subject articles and finishes to accelerated weathering conditions; for example, a rich ultraviolet source, water spray, or salt water. { ˌweth·ə'räm·əd·ər }

weatherproof [ENG] Able to withstand exposure to weather without damage. { 'weth·ərˌprüf }

weather radar [ENG] Generally, any radar which is suitable or can be used for the detection of precipitation or clouds. Also known as weather observation radar. { 'weth·ər 'rāˌdär }

weather resistance [ENG] The ability of a material, paint, film, or the like to withstand the effects of wind, rain, or sun and to retain its appearance and integrity. { 'weth·ər riˌzis·təns }

weather strip [BUILD] A piece of material, such as wood or rubber, applied to the joints of a window or door to stop drafts. { 'weth·ərˌstrip }

weather-struck joint [CIV ENG] A horizontal joint in a course of masonry in which the mortar at the upper edge has been pressed in, forming a convex surface that sheds water. Also known as weathered joint. { 'weth·ər ˌstrək ˌjȯint }

web [CIV ENG] The vertical strip connecting the upper and lower flanges of a rail or girder. [MECH ENG] For twist drills and reamers, the central portion of the tool body that joins the loads. { web }

web angle *See* chisel-edge angle. { 'web ˌaŋ·gəl }

Weber number 3 [CHEM ENG] A dimensionless number used in interfacial area determination in distillation equipment, equal to the surface tension divided by the product of the liquid density, the acceleration of gravity, and the depth of liquid on the tray under consideration. Symbolized N_{We3}. { 'vā·bər ˌnəm·bər 'thrē }

web plate [ENG] A steel plate that forms the web of a beam, girder, or truss. { 'web ˌplāt }

wedge [DES ENG] A piece of resistant material whose two major surfaces make an acute angle. [ENG] In ultrasonic testing, a device which directs waves of ultrasonic energy into the test piece at an angle. { wej }

wedge bit [DES ENG] A tapered-nose noncoring bit, used to ream out the borehole alongside the steel deflecting wedge in hole-deflection operations. Also known as bull-nose bit; wedge reaming bit; wedging bit. { 'wej ˌbit }

wedge bonding [ENG] A type of thermocompression bonding in which a wedge-shaped tool is used to press a small section of the lead wire onto the bonding pad of an integrated circuit. { 'wej ˌbänd·iŋ }

wedge core lifter [MECH ENG] A core-gripping device consisting of a series of three or more serrated-face, tapered wedges contained in slotted and tapered recesses cut into the inner surface of a lifter case or sleeve; the case is threaded to the inner tube of a core barrel, and as the core enters the inner tube, it lifts the wedges up along the case taper; when the barrel is raised, the wedges are pulled tight, gripping the core. { 'wej ˈkȯrˌlif·tər }

wedge photometer [ENG] A photometer in which the luminous flux density of light from two sources is made equal by pushing into the beam from the brighter source a wedge of absorbing material; the wedge has a scale indicating how much it reduces the flux density, so that the luminous intensities of the sources may be compared. { 'wej fə'täm·əd·ər }

wedge reaming bit *See* wedge bit. { 'wej 'rēm·iŋ ˌbit }

wedging [ENG] **1.** A method used in quarrying to obtain large, regular blocks of building stones; a row of holes is drilled, either by hand or by pneumatic drills, close to each other so that a longitudinal crevice is formed into which a gently sloping steel wedge is driven, and the block of stone can be detached without shattering. **2.** The act of changing the course of a borehole by using a deflecting wedge. **3.** The lodging of two or more wedge-shaped pieces of core inside a core barrel, and therefore blocking it. **4.** The material, moss, or wood used to render the shaft lining tight. { 'wej·iŋ }

wedging bit *See* wedge bit. { 'wej·iŋ ˌbit }

weep hole [CIV ENG] A hole in a wood sill, retaining wall, or other structure to allow accumulated water to escape. { 'wēp ˌhōl }

weighing rain gage [ENG] A type of recording rain gage, consisting of a receiver in the shape of a funnel which empties into a bucket mounted upon a weighing mechanism; the weight of the catch is recorded, on a clock-driven chart, as inches of precipitation; used at climatological stations. { 'wā·iŋ 'rān gāj }

weight [MECH] **1.** The gravitational force with

which the earth attracts a body. **2.** By extension, the gravitational force with which a star, planet, or satellite attracts a nearby body. { wāt }

weight barometer [ENG] A mercury barometer which measures atmospheric pressure by weighing the mercury in the column or the cistern. { 'wāt bəˌräm·əd·ər }

weighting [ENG] The artificial adjustment of measurements to account for factors that, in the normal use of the device, would otherwise be different from conditions during the measurements. { 'wād·iŋ }

weighting network [ENG ACOUS] One of three or more circuits in a sound-level meter designed to adjust its response; the A and B weighting networks provide responses approximating the 40- and 70-phon equal loudness contours, respectively, and the C weighting network provides a flat response up to 8000 hertz. { 'wād·iŋ ˌnet ˌwərk }

weightlessness [MECH] A condition in which no acceleration, whether of gravity or other force, can be detected by an observer within the system in question. Also known as zero gravity. { 'wāt·ləs·nəs }

weight-loaded regulator [ENG] A pressure-regulator valve for pressure vessels or flow systems; the regulator is preloaded by counterbalancing weights to open (or close) at the upper (or lower) limit of a preset pressure range. { 'wāt ˌlōd·əd 'reg·yəˌlād·ər }

weight thermometer [ENG] A glass vessel for determining the thermal expansion coefficient of a liquid by measuring the mass of liquid needed to fill the vessel at two different temperatures. { 'wāt ˌthərˌmäm·əd·ər }

weir [CIV ENG] A dam in a waterway over which water flows, serving to regulate water level or measure flow. { wer }

weld gage [ENG] A device used to check the shape and size of welds. { 'weld ˌgāj }

welding tip [ENG] A replaceable nozzle for a gas torch used in welding. { 'weld·iŋ ˌtip }

welding torch [ENG] A gas-mixing and burning tool for the welding of metal. { 'weld·iŋ ˌtȯrch }

weld-interval timer [ENG] A device used to control weld interval. { 'weld ˌin·tər·vəl ˌtīm·ər }

weld line *See* flow line. { 'weld ˌlīn }

weld mark *See* flow line. { 'weld ˌmärk }

weldment [ENG] An assembly or structure whose component parts are joined by welding. { 'weld·mənt }

well [BUILD] An open shaft in a building, extending vertically through floors to accommodate stairs or an elevator. [ENG] A hole dug into the earth to reach a supply of water, oil, brine, or gas. { wel }

well core [ENG] A sample of rock penetrated in a well or other borehole obtained by use of a hollow bit that cuts a circular channel around a central column or core. { 'wel ˌkȯr }

well drill [MECH ENG] A drill, usually a churn drill, used to drill water wells. { 'wel ˌdril }

wellhead [CIV ENG] The top of a well. { 'welˌhed }

well logging [ENG] The technique of analyzing and recording the character of a formation penetrated by a drill hole in petroleum exploration and exploitation work. { 'wel ˌläg·iŋ }

wellpoint [CIV ENG] A component of a wellpoint system consisting of a perforated pipe about 4 feet (1.2 meters) long and about 2 inches (5 centimeters) in diameter, equipped with a ball valve, a screen, and a jetting tip. { 'welˌpȯint }

wellpoint system [CIV ENG] A method of keeping an excavated area dry by intercepting the flow of groundwater with pipe wells located around the excavation area. { 'welˌpȯint ˌsis·təm }

well-regulated system [CONT SYS] A system with a regulator whose action, together with that of the environment, prevents any disturbance from permanently driving the system from a state in which it is stable, that is, a state in which it retains its structure and survives. { 'wel ˈreg·yəˌlād·əd ˌsis·təm }

well shooting [ENG] The firing of a charge of nitroglycerin, or other high explosive, in the bottom of a well for the purpose of increasing the flow of water, oil, or gas. { 'wel ˌshüd·iŋ }

well-type manometer [ENG] A type of double-leg, glass-tube manometer; one leg has a relatively small diameter, and the second leg is a reservoir; the level of the liquid in the reservoir does not change appreciably with change of pressure; a mercury barometer is a common example. { 'wel ˈtīp məˈnäm·əd·ər }

welt [BUILD] **1.** In sheet-metal roofing, a seam consisting of two joined sheets of metal whose edges have been folded over each other and fastened down flat. **2.** A strip of wood fastened over a flush seam or joint for added strength. [ENG] A strip that has been fastened to the edges of plates that form a butt joint in a steam boiler. { welt }

Wentworth quick-return motion *See* turning-block linkage. { 'went,wərth 'kwik riˈtərn ˌmō·shən }

Weston standard cell [ELEC] A standard cell used as a highly accurate voltage source for calibrating purposes; the positive electrode is mercury, the negative electrode is cadmium, and the electrolyte is a saturated cadmium sulfate solution; the Weston standard cell has a voltage of 1.018636 volts at 20°C. { 'wes·tən 'stan·dərd 'sel }

Westphal balance [ENG] A direct-reading instrument for determining the densities of solids and liquids; a plummet of known mass and volume is immersed in the liquid whose density is to be measured or, alternatively, a sample of the solid whose density is to be measured is immersed in a liquid of known density, and the loss in weight is measured, using a balance with movable weights. { 'west,fȯl ˌbal·ənz }

wet and dry bulb thermometer *See* psychrometer. { ˌwet ən ˌdrī ˌbəlb thərˈmäm·əd·ər }

wet blasting [ENG] Shot firing in wet holes. { 'wet 'blast·iŋ }

wet-bulb thermometer [ENG] A thermometer having the bulb covered with a cloth, usually muslin or cambric, saturated with water. { 'wet ¦bəlb thər'mäm·əd·ər }

wet cell [ELEC] A primary cell in which there is a substantial amount of free electrolyte in liquid form. { 'wet ˌsel }

wet classifier [ENG] A device for the separation of solid particles in a mixture of solids and liquid into fractions, according to particle size or density by methods other than screening; operates by the difference in the settling rate between coarse and fine or heavy and light particles in a tank-confined liquid. { 'wet 'klas·əˌfī·ər }

wet collector *See* scrubber. { 'wet kə'lek·tər }

wet cooling tower [MECH ENG] A structure in which water is cooled by atomization into a stream of air; heat is lost through evaporation. Also known as evaporative cooling tower. { 'wet 'kül·iŋ ˌtaù·ər }

wet drill [MECH ENG] A percussive drill with a water feed either through the machine or by means of a water swivel, to suppress the dust produced when drilling. { 'wet ¦dril }

wet engine [MECH ENG] An engine with its oil, liquid coolant (if any), and trapped fuel inside. { 'wet 'en·jən }

wet grinding [MECH ENG] **1.** The milling of materials in water or other liquid. **2.** The practice of applying a coolant to the work and the wheel to facilitate the grinding process. { 'wet ¦grīnd·iŋ }

wet hole [ENG] A borehole that traverses a water-bearing formation from which the flow of water is great enough to keep the hole almost full of water. { 'wet ˌhōl }

wet mill [MECH ENG] **1.** A grinder in which the solid material to be ground is mixed with liquid. **2.** A mill in which the grinding energy is developed by a fast-flowing liquid stream; for example, a jet pulverizer. { 'wet 'mil }

wet scrubber [ENG] A device designed to clean a gas stream by bringing it into contact with a liquid. { 'wet 'skrəb·ər }

wet sleeve [MECH ENG] A cylinder liner which is exposed to the coolant over 70% or more of its surface. { 'wet 'slēv }

wet slip [CIV ENG] An opening between two wharves or piers where dock trials are usually conducted, and the final fitting out is done. { 'wet 'slip }

wetted-wall column [CHEM ENG] A vertical column that operates with the inner walls wetted by the liquid being processed; used in theoretical studies of mass transfer rates and in analytical distillations; an example is a spinning-band column. { 'wed·əd ¦wȯl 'käl·əm }

wet-test meter [ENG] A device to measure gas flow by counting the revolutions of a shaft upon which water-sealed, gas-carrying cups of fixed capacity are mounted. { 'wet ¦test ˌmēd·ər }

wetting [ELECTR] The coating of a contact surface with an adherent film of mercury. { 'wed·iŋ }

wetting agent [CHEM ENG] A substance that increases the rate at which a liquid spreads across a surface when it is added to the liquid in small amounts. { 'wed·iŋ ˌā·jənt }

wet well [MECH ENG] A chamber which is used for collecting liquid, and to which the suction pipe of a pump is attached. { 'wet ˌwel }

whaler *See* waler. { 'wāl·ər }

wharf [CIV ENG] A structure of open construction built parallel to the shoreline; used by vessels to receive and discharge passengers and cargo. { 'wȯrf }

Wheatstone bridge [ELEC] A four-arm bridge circuit, all arms of which are predominately resistive; used to measure the electrical resistance of an unknown resistor by comparing it with a known standard resistance. Also known as resistance bridge; Wheatstone network. { 'wēt ˌstōn 'brij }

wheel [DES ENG] A circular frame with a hub at the center for attachment to an axle, about which it may revolve and bear a load. { 'wēl }

wheelbarrow [ENG] A small, hand-pushed vehicle with a single wheel and axle between the front ends of two shafts that support a boxlike body and serve as handles at the rear. Also known as barrow. { 'wēlˌbar·ō }

wheel base [DES ENG] The distance in the direction of travel from front to rear wheels of a vehicle, measured between centers of ground contact under each wheel. { 'wēl ˌbās }

wheel dresser [ENG] A tool for cleaning, resharpening, and restoring the mechanical accuracy of the cutting faces of grinding wheels. { 'wēl ˌdres·ər }

wheeled crane [MECH ENG] A self-propelled crane that rides on a rubber-tired chassis with power for transportation provided by the same engine that is used for hoisting. { 'wēld 'krān }

wheel load capacity [CIV ENG] The capacity of airfield runways, taxiways, parking areas, or roadways to bear the pressures exerted by aircraft or vehicles in a gross weight static configuration. { 'wēl 'lōd kəˌpas·əd·ē }

wheel sleeve [DES ENG] A flange used as an adapter on precision grinding machines where the hole in the wheel is larger than the machine arbor. { 'wēl ˌslēv }

white coat [BUILD] The finishing coat in plastering. { 'wīt ˌkōt }

Whitworth screw thread [DES ENG] A British screw thread standardized to form and dimension. { 'wit ˌwərth 'skrü ˌthred }

whr *See* watt-hour.

wicket dam [CIV ENG] A movable dam consisting of a number of rectangular panels of wood or iron hinged to a sill and propped vertically; the prop is hinged and can be tripped to drop the wickets flat on the sill. { 'wik·ət ˌdam }

wicking [ENG] The flow of solder under the insulation of covered wire. { 'wik·iŋ }

wide band [ELECTR] Property of a tuner, amplifier, or other device that can pass a broad range of frequencies. { 'wīd ¦band }

wide-flange beam *See* H beam. { ¦wīd ¦flanj 'bēm }

Wiese formula [ENG] An empirical relationship for motor fuel antiknock values above 100 in relation to performance numbers; basis for the American Society for Testing and Materials scale, in which octane numbers above 100 are related to increments of tetraethyllead added to isooctane. { 'vē·zə ˌfór·myə·lə }

Wild fence [ENG] A wooden enclosure about 16 feet (4.8 meters) square and 8 feet (2.4 meters) high with a precipitation gage in its center; the function of the fence is to minimize eddies around the gage, and thus ensure a catch which will be representative of the actual rainfall or snowfall. { 'wīld ˌfens }

Willans line [MECH ENG] The line (nearly straight) on a graph showing steam consumption (pounds per hour) versus power output (kilowatt or horsepower) for a steam engine or turbine; frequently extended to show total fuel consumed (pounds per hour) for gas turbines, internal combustion engines, and complete power plants. { 'wil·ənz ˌlīn }

winch [MECH ENG] A machine having a drum on which to coil a rope, cable, or chain for hauling, pulling, or hoisting. { winch }

winch operator *See* hoistman. { 'winch ˌäp·əˌrād·ər }

windage [MECH] **1.** The deflection of a bullet or other projectile due to wind. **2.** The correction made for such deflection. { 'win·dij }

windage loss [ENG] In a ventilating or air-conditioning system, the decrease in the water content of the circulating air due to the loss of entrained droplets of water; expressed as a percentage of the rate of circulation. { 'win·dij ˌlȯs }

wind box [ENG] A plenum chamber that supplies air for combustion to a stoker, gas burner, or oil burner. { 'wind ˌbäks }

windbreak [ENG] Any device designed to obstruct wind flow and intended for protection against any ill effects of wind. { 'winˌbrāk }

wind cone [ENG] A tapered fabric sleeve, shaped like a truncated cone and pivoted at its larger end on a standard, for the purpose of indicating wind direction; since the air enters the fixed end, the small end of the cone points away from the wind. Also known as wind sleeve; wind sock. { 'win ˌkōn }

wind correction [ENG] Any adjustment which must be made to allow for the effect of wind; especially, the adjustments to correct for the effect on a projectile in flight, on sound received by sound ranging instruments, and on an aircraft flown by dead reckoning navigation. { 'win kəˈrek·shən }

wind deflection [MECH] Deflection caused by the influence of wind on the course of a projectile in flight. { 'win diˌflek·shən }

wind-direction indicator [ENG] A device to indicate the direction from which the wind blows; an example is a weather vane. { 'win dəˈrek·shən ˌin·dəˌkād·ər }

winder [BUILD] A step, generally wedge-shaped, with a tread that is wider at one end than the other; often used in spiral staircases. { 'wīn·dər }

wind guard [CIV ENG] A building component that protects the building or some part of it against the wind, for example, a chimney cap. { 'winˌgärd }

winding [ELEC] **1.** One or more turns of wire forming a continuous coil for a transformer, relay, rotating machine, or other electric device. **2.** A conductive path, usually of wire, that is inductively coupled to a magnetic storage core or cell. { 'wīnd·iŋ }

winding engine *See* hoist. { 'wīnd·iŋ ˌen·jən }

windmill [MECH ENG] Any of various mechanisms, such as a mill, pump, or electric generator, operated by the force of wind against vanes or sails radiating about a horizontal shaft. { 'winˌmil }

windmill anemometer [ENG] A rotation anemometer in which the axis of rotation is horizontal; the instrument has either flat vanes (as in the air meter) or helicoidal vanes (as in the propeller anemometer); the relation between wind speed and angular rotation is almost linear. { 'winˌmil ˌan·əˈmäm·əd·ər }

windmilling [MECH ENG] The rotation of a propeller from the force of the air when the engine is not operating. { 'winˌmil·iŋ }

window [BUILD] An opening in the wall of a building or the body of a vehicle to admit light and usually to permit vision through a transparent or translucent material, usually glass. [ELECTR] A material having minimum absorption and minimum reflection of radiant energy, sealed into the vacuum envelope of a microwave or other electron tube to permit passage of the desired radiation through the envelope to the output device. { 'win·dō }

window bar [BUILD] **1.** A bar for securing a casement window or window shutters. **2.** A bar that prevents ingress or egress through a window. **3.** *See* sash bar. { 'winˌdō ˌbär }

wind power [MECH ENG] The extraction of kinetic energy from the wind and conversion of it into a useful type of energy: thermal, mechanical, or electrical. { 'win ˌpaü·ər }

wind pressure [MECH] The total force exerted upon a structure by wind. Also known as velocity pressure. { 'win ˌpresh·ər }

windshield [ENG] A transparent glass screen that protects the passengers and compartment of a vehicle from wind and rain. { 'winˌshēld }

wind shield *See* rain-gage shield. { 'win ˌshēld }

wind sleeve *See* wind cone. { 'win ˌslēv }

wind sock *See* wind cone. { 'win ˌsäk }

wind tee [ENG] A weather vane shaped like the letter T or like an airplane, situated on an airport or landing field to indicate the wind direction. Also known as landing tee. { 'win ˌtē }

wind tunnel [ENG] A duct in which the effects of airflow past objects can be determined. { 'win ˌtən·əl }

wind-tunnel instrumentation [ENG] Measuring devices used in wind-tunnel tests; in addition to conventional laboratory instruments for fluid

flow, thermometry, and mechanical measurements, there are sensing devices capable of precision measurement in the small-scale environment of the test setup. { 'win ˌtən·əl ˌin·strə·mənˈtā·shən }

windup [MECH ENG] The twisting of a shaft under a torsional load, usually resulting in vibration and other undesirable effects as the shaft relaxes. { 'wīnˌdəp }

wind vane [ENG] An instrument used to indicate wind direction, consisting basically of an asymmetrically shaped object mounted at its center of gravity about a vertical axis; the end which offers the greater resistance to the motion of air moves to the downwind position; the direction of the wind is determined by reference to an attached oriented compass rose. { 'win ˌvān }

wing dam *See* groin. { 'wiŋ ˌdam }

wingless abutment [CIV ENG] A straight-sided bridge abutment designed to resist pressure in back and provide a bridge seat. { 'wiŋ·ləs əˈbət·mənt }

wing nut [DES ENG] An internally threaded fastener with wings to permit it to be tightened or loosened by finger pressure only. Also known as butterfly nut. { 'wiŋ ˌnət }

wing screw [DES ENG] A screw with a wing-shaped head that can be turned manually. { 'wiŋ ˌskrü }

winterization [ENG] The preparation of equipment for operation in conditions of winter weather; this applies to preparation not only for cold temperatures, but also for snow, ice, and strong winds. { ˌwin·tə·rəˈzā·shən }

wire [ELEC] A single bare or insulated metallic conductor having solid, stranded, or tinsel construction, designed to carry current in an electric circuit. Also known as electric wire. { wīr }

wire bonding [ELEC] Lead-covered tie used to connect two cable sheaths until a splice is permanently closed and covered. [ELECTR] **1.** A method of connecting integrated-circuit chips to their substrate, using ultrasonic energy to weld very fine wires mechanically from metallized terminal pads along the periphery of the chip to corresponding bonding pads on the substrate. **2.** The attachment of very fine aluminum or gold wire (by thermal compression or ultrasonic welding) from metallized terminal pads along the periphery of an integrated circuit chip to corresponding bonding pads on the surface of the package leads. { 'wīr ˌbänd·iŋ }

wire cloth [DES ENG] Screen composed of wire crimped or woven into a pattern of squares or rectangles. { 'wīr ˌklȯth }

wire comb [ENG] A tool for roughening a base coat of plaster in order to improve bonding of the next coat. Also known as wire scratcher. { ˈwīr ˈkōm }

wire drag [ENG] An apparatus for surveying rocky underwater areas where normal sounding methods are insufficient to ensure the discovery of all existing submerged obstructions, small shoals, or rocks above a given depth or for determining the least depth of an area; it consists essentially of a buoyed wire towed at the desired depth by two launches. { 'wīr 'drag }

wire-fabric reinforcing [CIV ENG] Reinforcing concrete or mortar with a welded wire fabric. { 'wīr ˈfab·rik ˌrē·ənˈfȯrs·iŋ }

wire flame spray gun [ENG] A device which utilizes the heat from a gas flame and material in the form of wire or rod to perform a flame-spraying operation. { 'wīr ˈflām 'sprā ˌgən }

wire fusing current [ELEC] The electric current which will cause a wire to melt. { 'wīr ˈfyüz·iŋ ˌkə·rənt }

wire gage [DES ENG] **1.** A gage for measuring the diameter of wire or thickness of sheet metal. **2.** A standard series of sizes arbitrarily indicated by numbers, to which the diameter of wire or the thickness of sheet metal is usually made, and which is used in describing the size or thickness. { 'wīr ˌgāj }

wire lath [ENG] A netting formed of welded wire, usually with a paper backing, and used as a base for plaster. { ˈwīr 'lath }

wire line [DES ENG] **1.** Any cable or rope made of steel wires twisted together to form the strands. **2.** A steel wire rope 5/16 inch (7.94 millimeters) or less in diameter. [ELECTR] One or more current-conducting wires or cables, used for communication, control, or telemetry. { 'wīr ˌlīn }

wire nail [DES ENG] A nail made of wire and having a circular cross section. { 'wīr ˌnāl }

wire recorder [ENG ACOUS] A magnetic recorder that utilizes a round stainless steel wire about 0.004 inch (0.01 centimeter) in diameter instead of magnetic tape. { 'wīr riˌkȯrd·ər }

wire recording [ENG ACOUS] Magnetic recording by use of a magnetized wire. { 'wīr ri ˌkȯrd·iŋ }

wire rope [ENG] A rope formed of twisted strands of wire. { 'wīr ˌrōp }

wire saw [MECH ENG] A machine employing one- or three-strand wire cable, up to 16,000 feet (4900 meters) long, running over a pulley as a belt; used in quarries to cut rock by abrasion. { 'wīr 'sȯ }

wire scratcher *See* wire comb. { 'wīr ˌskrach·ər }

wiresonde [ENG] An atmospheric sounding instrument which is supported by a captive balloon and used to obtain temperature and humidity data from the ground level to a height of a few kilometers; height is determined by means of a sensitive altimeter, or from the amount of cable released and the angle which the cable makes with the ground, and the information is telemetered to the ground through a wire cable. { 'wīrˌsänd }

wire stripper [ENG] A hand-operated tool or special machine designed to cut and remove the insulation for a predetermined distance from the end of an insulated wire, without damaging the solid or stranded wire inside. { 'wīr ˌstrip·ər }

wire tack [DES ENG] A tack made from wire stock. { 'wīr ˌtak }

wire train [ENG] An assembly that normally consists of an extruder, a crosshead and die, a

means of cooling, and feed and take-up spools for the wire; used to coat wire with resin. { 'wīr ˌtrān }

wireway [ENG] A trough which is lined with sheet metal and has hinged covers, designed to house electrical conductors or cables. { 'wīrˌwā }

wire weight gage [ENG] A river gage in which a weight suspended on a wire is lowered to the water surface from a bridge or other overhead structure to measure the distance from a point of known elevation on the bridge to the water surface; the distance is usually measured by counting the number of revolutions of a drum required to lower the weight, and a counter is provided which reads the water stage directly. { 'wīr 'wāt ˌgāj }

wiring [ELEC] The installation and utilization of a system of wire for conduction of electricity. Also known as electric wiring. [ENG] A forming process in which the edge of a sheet-metal part is rolled over a wire to produce a tubular rim containing the wire. { 'wīr·iŋ }

wiring diagram *See* circuit diagram. { 'wīr·iŋ ˌdī·əˌgram }

wiring harness [ELEC] An array of insulated conductors bound together by lacing cord, metal bands, or other binding, in an arrangement suitable for use only in specific equipment for which the harness was designed; it may include terminations. { 'wīr·iŋ ˌhär·nəs }

Wobbe index [THERMO] A measure of the amount of heat released by a gas burner with a constant orifice, equal to the gross calorific value of the gas in British thermal units per cubic foot at standard temperature and pressure divided by the square root of the specific gravity of the gas. { 'wä·bə ˌinˌdeks }

wobble friction [ENG] A force that occurs in prestressed concrete when the prestressing tendon deviates from its specified profile. { 'wäb·əl ˌfrik·shən }

wobble wheel roller [MECH ENG] A roller with freely suspended pneumatic tires used in soil stabilization. { 'wäb·əl ˌwēl ˌrō·lər }

Wollaston wire [ENG] An extremely fine platinum wire, produced by enclosing a platinum wire in a silver sheath, drawing them together, and using acid to dissolve away the silver; used in electroscopes, microfuses, and hot-wire instruments. { 'wùl·ə·stən ˌwīr }

wood-carving tools [DES ENG] The tools normally used in wood carving; they consist of adzes, chisels, gouges, files, and rasps, all of which vary in size and shape. { 'wúd ˌkärv·iŋ ˌtülz }

Woodruff key [DES ENG] A self-aligning machine key made by a side-milling cutter in the form of a segment of a disk. { 'wù·drəf ˌkē }

wood screw [DES ENG] A threaded fastener with a pointed shank, a slotted or recessed head, and a sharp tapered thread of relatively coarse pitch for use only in wood. { 'wúd ˌskrü }

woodstave pipe [DES ENG] A pipe made of narrow strips of wood placed side by side and banded with wire, metal collars, and inserted joints, used largely for municipal water supply, outfall sewers, and mining irrigation. { 'wúd ˌstāv ˌpīp }

woofer [ENG ACOUS] A large loudspeaker designed to reproduce low audio frequencies at relatively high power levels; usually used in combination with a crossover network and a high-frequency loudspeaker called a tweeter. { 'wúf·ər }

word concatenation system [ENG ACOUS] The simplest form of voice response system, which retrieves previously spoken versions of words or phrases and carefully forms them into a sequence without pauses, to approximate normally spoken word sequences. { 'wȯrd kənˌkat·ənˈā·shən ˌsis·təm }

work [ELEC] *See* load. [IND ENG] The physical or mental effort expended in the performance of a task. [MECH] The transference of energy that occurs when a force is applied to a body that is moving in such a way that the force has a component in the direction of the body's motion; it is equal to the line integral of the force over the path taken by the body. { wərk }

work breakdown structure [IND ENG] A hierarchy designed to organize, define, and display all the work that must be performed in order to accomplish the objectives of a project. { ˈwərk ˈbrākˌdaún ˌstrək·chər }

work cycle [IND ENG] A sequence of tasks, operations, and processes, or a pattern of manual motions, elements, and activities that is repeated for each unit of work. { 'wərk ˌsī·kəl }

work design *See* job design. { 'wərk di,zīn }

worked penetration [ENG] Penetration of a sample of lubricating grease immediately after it has been brought to a specified temperature and subjected to strokes in a standard grease worker. { 'wərkt ˌpen·əˈtrā·shən }

work element [IND ENG] In planning a manufacturing process, a single task that cannot be subdivided. { 'wərk ˌel·ə·mənt }

work function *See* free energy. { 'wərk ˌfəŋk·shən }

workhead *See* headstock. { 'wərkˌhed }

working area [IND ENG] A portion of the workplace in which a worker moves about while fulfilling work tasks. { 'wərk·iŋ ˌer·ē·ə }

working envelope [MECH ENG] The surface bounding the maximum extent and reach of a robot's wrist, excluding the tool tip. Also known as working profile. { 'wərk·iŋ 'en·vəˌlōp }

working life *See* work life. { ˌwərk·iŋ ˌlīf }

working load [ENG] The maximum load that any structural member is designed to support. { 'wərk·iŋ ˌlōd }

working pressure [ENG] The allowable operating pressure in a pressurized vessel or conduit, usually calculated by ASME (American Society of Mechanical Engineers) or API (American Petroleum Institute) codes. { 'wərk·iŋ ˌpresh·ər }

working profile *See* working envelope. { 'wərk·iŋ 'prō,fīl }
working Q *See* loaded Q. { 'wərk·iŋ 'kyü }
working space-volume [MECH ENG] The volume enclosed by a robot's working envelope. { 'wərk·iŋ 'spās 'väl·yəm }
working voltage *See* voltage rating. { 'wərk·iŋ ˌvōl·tij }
work-kinetic energy theorem [MECH] The theorem that the change in the kinetic energy of a particle during a displacement is equal to the work done by the resultant force on the particle during this displacement. { 'wərk ki'ned·ik ¦en·ər·jē ˌthir·əm }
work life [CHEM ENG] The period of time a resin or an adhesive will remain usable after it is mixed with a catalyst and other ingredients. Also known as pot life; working life. { 'wərk ˌlīf }
work measurement [IND ENG] **1.** Determination of the difficulty of a given task by using both physiologic and biomechanical parameters to evaluate compatibility of available motions with motions required to perform the task. **2.** *See* ergonometrics. { 'wərk ˌmezh·ər·mənt }
work of adhesion *See* adhesional work. { 'wərk əv ad'hē·zhən }
work package [IND ENG] The amount of work required to complete a given job that falls within the responsibility of a single unit of the organization handling the project. { 'wərk ˌpak·ij }
work physiology [IND ENG] An aspect of industrial engineering that takes into account metabolic cost, measurement and prevention of work strain, and other ergonomic factors in the design of tasks and workplaces. { 'wərk ˌfiz·ē,äl·ə·jē }
workpiece [IND ENG] An object that is being manufactured. { 'wərk,pēs }
workpiece program [CONT SYS] A program that directs the machining of a component under numerical or computer control. { 'wərk,pēs ˌprō ˌgram }
work sampling [IND ENG] A technique to measure work activity as related to delays consisting of intermittent observations of actual work and delays. Also known as activity sampling; frequency study; ratio delay study. { 'wərk ˌsam·pliŋ }
work standardization [IND ENG] The establishment of uniformity of working conditions, tools, equipment, technical procedures, administrative procedures, workplace arrangements, motion sequences, materials, quality requirements, and similar factors which affect the performance of work. { 'wərk ˌstan·dər·də'zā·shən }
work station [IND ENG] A workplace that is included in a production system or on a piece of equipment at which an individual worker may spend only a portion of a working shift. { 'wərk ˌstā·shən }
work station independence [CONT SYS] Property of a numerical control or robot program which does not depend on the nature of the work station. { 'wərk,stā·shən ˌin·də'pen·dəns }
work stress [IND ENG] Any external force that acts on the body of a worker during the performance of a task. { 'wərk ˌstres }
work task [IND ENG] A specified amount of work, set of responsibilities, or occupation assigned to an individual or to a group. { 'wərk ˌtask }
work tolerance [IND ENG] A time period during which a worker can effectively perform a task without a rest period while maintaining acceptable levels of physiological and emotional well-being. { 'wərk ˌtäl·ə·rəns }
work unit [IND ENG] An amount of work or the result of an amount of work that is treated as an integer (a single piece of information) when work is being characterized quantitatively. { 'wərk ˌyü·nət }
world coordinates [CONT SYS] A robotic coordinate system that is fixed with respect to the Earth. { 'wərld kō'ȯrd·ən·əts }
world modeling [CONT SYS] Robot programming that allows the system to perform complex tasks, based on stored data. { 'wərld 'mäd·əl·iŋ }
worm [DES ENG] A shank having at least one complete tooth (thread) around the pitch surface; the driver of a worm gear. { wərm }
worm conveyor *See* screw conveyor. { 'wərm kən'vā·ər }
worm gear [DES ENG] A gear with teeth cut on an angle to be driven by a worm; used to connect nonparallel, nonintersecting shafts. { 'wərm ˌgir }
worm wheel [DES ENG] A gear wheel with curved teeth that meshes with a worm. { 'wərm ˌwēl }
wow [ENG ACOUS] A low-frequency flutter; when caused by an off-center hole in a disk record, occurs once per revolution of the turntable. { waù }
wrap-around grasp [IND ENG] A basic grasp whereby an object is held against the palm by the fingers wrapped around it, with the thumb opposing the index finger. { 'rap·əˌraùnd ˌgrasp }
wrap forming *See* stretch forming. { 'rap ˌfȯrm·iŋ }
wrapper sheet [MECH ENG] **1.** The outer plate enclosing the firebox in a fire-tube boiler. **2.** The thinner sheet of a boiler drum having two sheets. { 'rap·ər ˌshēt }
wrecking ball *See* skull cracker. { 'rek·iŋ ˌbȯl }
wrecking bar *See* ripping bar. { 'rek·iŋ ˌbär }
wrecking strip [CIV ENG] A small section that is fitted into a form for poured concrete and is easily removed before the main panels to facilitate disassembly of the main components of the form. { 'rek·iŋ ˌstrip }
wrench [ENG] A manual or power tool with adapted or adjustable jaws or sockets either at the end or between the ends of a lever for holding or turning a bolt, pipe, or other object. [MECH] The combination of a couple and a force which is parallel to the torque exerted by the couple. { rench }

wrench-head bolt [DES ENG] A bolt with a square or hexagonal head designed to be gripped between the jaws of a wrench. { 'rench ¦hed ¸bōlt }

wringing fit [DES ENG] A fit of zero-to-negative allowance. { 'riŋ·iŋ 'fit }

wrist [MECH ENG] A set of rotary joints to which the end effector of a robot is attached. Also known as wrist socket. { rist }

wrist pin *See* piston pin. { 'ris ¸pin }

write head [ELECTR] Device that stores digital information as coded electrical pulses on a magnetic drum, disk, or tape. { 'rīt ¸hed }

W-truss [CIV ENG] A truss having upper and lower chords joined by web members that form a shape resembling the letter W. { 'dəb·əl¸yü ¸trəs }

Wulf electrometer [ENG] **1.** A variant of the string electrometer in which charged metal plates are replaced by charged knife-edges. **2.** An electrometer in which two conducting fibers are placed side by side, and their separation upon charging is measured. { ¦wülf i¸lek'träm·əd·ər }

Wulff process [CHEM ENG] A chemical process to make acetylene and ethylene by cracking a hydrocarbon gas (for example, butane) with high-temperature steam in a regenerative furnace. { 'wülf ¸prä·səs }

Wurster process *See* air-suspension encapsulation. { 'wər·stər ¸prä·səs }

wye [ELEC] Polyphase circuit whose phase differences are 120° and which when drawn resembles the letter Y. [ENG] A pipe branching off a straight main run at an angle of 45°. Also known as Y; yoke. { wī }

wye branch *See* Y branch. { 'wī ¸branch }

wye fitting *See* Y fitting. { 'wī ¸fid·iŋ }

wye level *See* Y level. { 'wī ¸lev·əl }

X

X engine [MECH ENG] An in-line engine with the cylinder banks so arranged around the crankshaft that they resemble the letter X when the engine is viewed from the end. { 'eks ˌen·jən }

X frame [DES ENG] An automotive frame which either has side rails bent in at the center of the vehicle, making the overall form that of an X, or has an X-shaped member which joins the side rails with diagonals for added strength and resistance to torsional stresses. { 'eks ˌfrām }

x-ray diffractometer [ENG] An instrument used in x-ray analysis to measure the intensities of the diffracted beams at different angles. { 'eks ˌrā ˌdi,frak'täm·əd·ər }

x-ray goniometer [ENG] A scale designed to measure the angle between the incident and refracted beams in x-ray diffraction analysis. { 'eks ˌrā ˌgō·nē'äm·əd·ər }

x-ray machine [ENG] The x-ray tube, power supply, and associated equipment required for producing x-ray photographs. { 'eks ˌrā məˌshēn }

x-ray microscope [ENG] **1.** A device in which an ultra-fine-focus x-ray tube or electron gun produces an electron beam focused to an extremely small image on a transmission-type x-ray target that serves as a vacuum seal; the magnification is by projection; specimens being examined can thus be in air, as also can the photographic film that records the magnified image. **2.** Any of several instruments which utilize x-radiation for chemical analysis and for magnification of 100–1000 diameters; it is based on contact or projection microradiography, reflection x-ray microscopy, or x-ray image spectrography. { 'eks ˌrā 'mī·krəˌskōp }

x-ray monochromator [ENG] An instrument in which x-rays are diffracted from a crystal to produce a beam having a narrow range of wavelengths. { 'eks ˌrā ˌmän·əˈkrōˌmād·ər }

x-ray telescope [ENG] An instrument designed to detect x-rays emanating from a source outside the earth's atmosphere and to resolve the x-rays into an image; they are carried to high altitudes by balloons, rockets, or space vehicles; although several types of x-ray detector, involving gas counters, scintillation counters, and collimators, have been used, only one, making use of the phenomenon of total external reflection of x-rays from a surface at grazing incidence, is strictly an x-ray telescope. { 'eks ˌrā 'telˌəˌskōp }

x-ray thickness gage [ENG] A thickness gage used for measuring and indicating the thickness of moving cold-rolled sheet steel during the rolling process without making contact with the sheet; an x-ray beam directed through the sheet is absorbed in proportion to the thickness of the material and its atomic number. { 'eks ˌrā 'thik·nəs ˌgāj }

XY recorder [ENG] A recorder that traces on a chart the relation of two variables, neither of which is time. { ˌeksˈwī riˈkȯrd·ər }

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Y

yard [CIV ENG] A facility for building and repairing ships. [MECH] A unit of length in common use in the United States and United Kingdom, equal to 0.9144 meter, or 3 feet. Abbreviated yd. { yärd }

yardage [MECH] An amount expressed in yards. { 'yärd·ij }

yard crane *See* crane truck. { 'yärd ˌkrān }

yard drain [CIV ENG] A drain for clearing an open area of surface water. { 'yärd ˌdrān }

yard lumber [BUILD] A category of lumber up to 5 inches (12.5 centimeters) thick. { 'yärd ˌləm·bər }

yard maintenance [ENG] A category of maintenance that includes the complete rebuilding of parts, subassemblies, or components. { 'yärd ˌmaint·ən·əns }

yaw [MECH] **1.** The rotational or oscillatory movement of a ship, aircraft, rocket, or the like about a vertical axis. Also known as yawing. **2.** The amount of this movement, that is, the angle of yaw. **3.** To rotate or oscillate about a vertical axis. { yȯ }

yaw acceleration [MECH] The angular acceleration of an aircraft or missile about its normal or Z axis. { 'yȯ akˌsel·əˈrā·shən }

yaw axis [MECH] A vertical axis through an aircraft, rocket, or similar body, about which the body yaws; it may be a body, wind, or stability axis. Also known as yawing axis. { 'yȯ ˌak·səs }

yawing *See* yaw. { 'yȯ·iŋ }

yawing axis *See* yaw axis. { 'yȯ·iŋ ˌak·səs }

yaw simulator [CONT SYS] A test instrument used to derive and thereby permit study of probable aerodynamic behavior in controlled flight under specific initial conditions; certain components of the missile guidance system, such as the receiver or servo loop, are connected into the simulator circuitry; also, certain aerodynamic parameters of the specific missile must be known and set into the simulator; applicable to the yaw plane. { 'yȯ ˌsim·yəˌlād·ər }

Y branch [ENG] A Y-shaped branch in a piping system. Also known as wye branch. { 'wī ˌbranch }

yd *See* yard.

Y fitting [CIV ENG] A pipe fitting with one end subdivided to form two openings, usually at a 45° angle to the run of the pipe. Also known as wye fitting. { 'wī ˌfid·iŋ }

yield [ENG] Product of a reaction or process as in chemical reactions or food processing. [MECH] That stress in a material at which plastic deformation occurs. { yēld }

yield factor [IND ENG] The ratio of the amount of material that results from an industrial process to the amount of material that went into it. { 'yēld ˌfak·tər }

yield point [MECH] The lowest stress at which strain increases without increase in stress. { 'yēld ˌpȯint }

yield rate [IND ENG] The amount of satisfactory material available after the completion of a given manufacturing process expressed as a percentage of the total amount produced. { 'yēld ˌrāt }

yield strength [MECH] The stress at which a material exhibits a specified deviation from proportionality of stress and strain. { 'yēld ˌstreŋkth }

yield stress [MECH] The lowest stress at which extension of the tensile test piece increases without increase in load. { 'yēld ˌstres }

yield temperature [ENG] The temperature at which a fusible plug device melts and is dislodged by its holder and thus relieves pressure in a pressure vessel; it is caused by the melting of the fusible material, which is then forced from its holder. { 'yēld ˌtem·prə·chər }

yig device [ELECTR] A filter, oscillator, parametric amplifier, or other device that uses an yttrium-iron-garnet crystal in combination with a variable magnetic field to achieve wide-band tuning in microwave circuits. Derived from yttrium-iron-garnet device. { 'yig diˌvīs }

Y level [ENG] A surveyor's level with Y-shaped rests to support the telescope. Also known as wye level. { 'wī ˌlēv·əl }

yoke [DES ENG] A clamp or similar device to embrace and hold two other parts. [ELECTR] *See* deflection yoke. [ENG] **1.** A bar of wood used to join the necks of draft animals for working together. **2.** *See* wye. [MECH ENG] A slotted crosshead used instead of a connecting rod in some steam engines. { yōk }

York-Scheibel column *See* Scheibel extractor. { 'yȯrk 'shī·bəl ˌkäl·əm }

Young-Helmholtz laws [MECH] Two laws de-

scribing the motion of bowed strings; the first states that no overtone with a node at the point of excitation can be present; the second states that when the string is bowed at a distance of $1/n$ times the string's length from one of the ends, where n is an integer, the string moves back and forth with two constant velocities, one of which has the same direction as that of the bow and is equal to it, while the other has the opposite direction and is $n - 1$ times as large. { ˈyəŋ ˈhelmˌhōlts ˌlȯz }

Young's modulus [MECH] The ratio of a simple tension stress applied to a material to the resulting strain parallel to the tension. Also known as modulus of elasticity { ˈyəŋz ˌmäj·ə·ləs }

y parameter [ELECTR] One of a set of four transistor equivalent-circuit parameters, used especially with field-effect transistors, that conveniently specify performance for small voltage and current in an equivalent circuit; the equivalent circuit is a current source with shunt impedance at both input and output. { ˈwī pəˌram·əd·ər }

yttrium-iron-garnet device *See* yig device. { ˈi·trē·əm ˈī·ərn ˈgär·nət diˌvīs }

Z

zee [CIV ENG] A metal member whose cross section has a modified Z shape; the internal angles are slightly less than 90°. { zē }

Zener breakdown [ELECTR] Nondestructive breakdown in a semiconductor, occurring when the electric field across the barrier region becomes high enough to produce a form of field emission that suddenly increases the number of carriers in this region. Also known as Zener effect. { 'zē·nər 'brāk,daůn }

Zener diode [ELECTR] A semiconductor breakdown diode, usually constructed of silicon, in which reverse-voltage breakdown is based on the Zener effect. { 'zē·nər 'dī,ōd }

Zener diode voltage regulator *See* diode voltage regulator. { 'zē·nər 'dī,ōd 'vōl·tij ,reg·yə,lād·ər }

Zener effect *See* Zener breakdown.

zero adjuster [ENG] A device for adjusting the pointer position of an instrument or meter to read zero when the measured quantity is zero. { 'zir·ō ə,jəs·tər }

zero bevel gear [DES ENG] A special form of bevel gear having curved teeth with a zero-degree spiral angle. { 'zir·ō ¦bev·əl 'gir }

zero bias [ELECTR] The condition in which the control grid and cathode of an electron tube are at the same direct-current voltage. { 'zir·ō 'bī·əs }

zero defects [IND ENG] A program for improving product quality to the point of perfection, so there will be no failures due to defects in construction. { 'zir·ō 'dē,feks }

zero gravity *See* weightlessness. { 'zir·ō 'grav·əd·ē }

zero level [ENG ACOUS] Reference level used for comparing sound or signal intensities; in audio-frequency work, a power of 0.006 watt is generally used as zero level; in sound, the threshold of hearing is generally assumed as the zero level. { 'zir·ō ,lev·əl }

zero method *See* null method. { 'zir·ō ,meth·əd }

zero-order hold [CONT SYS] A device which converts a sampled output into an output which is held constant between samples at the last sampled value. { 'zir·ō ¦ȯrd·ər 'hōld }

zeroth law of thermodynamics [THERMO] A law that if two systems are separately found to be in thermal equilibrium with a third system, the first two systems are in thermal equilibrium with each other, that is, all three systems are at the same temperature. { ¦zir,ōth ,lȯ əv ,thər·mō·dī'nam·iks }

Ziegler process [CHEM ENG] A process for the low-pressure linear polymerization of ethylene and stereospecific polymerization of propylene; the product is a high-density polymer or elastomer. { 'zē·glər ,prä·səs }

zigzag rule [ENG] A folding ruler having pivoted sections that lock when the ruler is opened. { 'zig,zag ,rül }

zipper [ENG] A generic name for slide fasteners in which two sets of interlocking teeth of the same design provide sturdy and continuous closure for adjacent pieces of textile, leather, and other materials. { 'zip·ər }

zipper conveyor [MECH ENG] A type of conveyor belt with zipperlike teeth that mesh to form a closed tube; used to handle fragile materials. { 'zip·ər kən,vā·ər }

zirconium oxide-based oxygen transducer [ENG] A device in which the concentration of oxygen in a mixture of gases is determined from the diffusion voltage across a heated, suitably doped zirconium oxide material placed between this mixture and a reference gas. { zər¦kōn·ē·əm ¦äk,sīd ,bāst ¦äks·ə·jən tranz'düs·ər }

zone [MECH ENG] **1.** In a heating or air-conditioning system, one or more spaces whose temperature is regulated by a single control. **2.** A subdivision of a sprinkler, water-supply, or standpipe system. { zōn }

zone control [ENG] The zoning of a process or building, and the independent heating or temperature controls for each zone. { 'zōn kən ,trōl }

zone heat [CIV ENG] A central heating system arranged to allow different temperatures to be maintained at the same time in two or more areas of a building. { 'zōn ,hēt }

zone melting crystallization [CHEM ENG] A method for purification of crystalline solids; the sample, packed in a narrow column, is heated so that a molten zone passes down through the sample, carrying impurities with it. { 'zōn ¦mel·tiŋ ,krist·əl·ə'zā·shən }

zone-position indicator [ENG] Auxiliary radar set for indicating the general position of an object to another radar set with a narrower field. { 'zōn pə¦zish·ən 'in·də,kād·ər }

zoning [CIV ENG] Designation and reservation under a master plan of land use for light and heavy industry, dwellings, offices, and other buildings; use is enforced by restrictions on types of buildings in each zone. { 'zōn·iŋ }

zoom [ENG] To enlarge or reduce the size of an image in an optical system or electronic display. { züm }

Z parameter [ELECTR] One of a set of four transistor equivalent-circuit parameters; they are the inverse of the Y parameters. { 'zē pə,ram·əd·ər }

z-transfer function *See* pulsed transfer function. { 'zē 'tranz·fər ˌfəŋk·shən }

Z variometer *See* vertical intensity variometer. { 'zē ˌver·ē'äm·əd·ər }

Zyglo method [ENG] A procedure for visualizing incipient cracks caused by fatigue failure, in which the part is immersed in a special activated penetrating oil and viewed under black light. { 'zī·glō ˌmeth·əd }

Appendix

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Equivalents of commonly used units for the U.S. Customary System and the metric system

1 inch = 2.5 centimeters (25 millimeters)	1 centimeter = 0.4 inch	1 inch = 0.083 foot
1 foot = 0.3 meter (30 centimeters)	1 meter = 3.3 feet	1 foot = 0.33 yard (12 inches)
1 yard = 0.9 meter	1 meter = 1.1 yards	1 yard = 3 feet (36 inches)
1 mile = 1.6 kilometers	1 kilometer = 0.62 mile	1 mile = 5280 feet (1760 yards)
1 acre = 0.4 hectare	1 hectare = 2.47 acres	
1 acre = 4047 square meters	1 square meter = 0.00025 acre	
1 gallon = 3.8 liters	1 liter = 1.06 quarts = 0.26 gallon	1 quart = 0.25 gallon (32 ounces; 2 pints)
1 fluid ounce = 29.6 milliliters	1 milliliter = 0.034 fluid ounce	1 pint = 0.125 gallon (16 ounces)
32 fluid ounces = 946.4 milliliters		1 gallon = 4 quarts (8 pints)
1 quart = 0.95 liter	1 gram = 0.035 ounce	1 ounce = 0.0625 pound
1 ounce = 28.35 grams	1 kilogram = 2.2 pounds	1 pound = 16 ounces
1 pound = 0.45 kilogram	1 kilogram = 1.1×10^{-3} ton	1 ton = 2000 pounds
1 ton = 907.18 kilograms		
$°F = (1.8 \times °C) + 32$	$°C = (°F - 32) \div 1.8$	

Conversion factors for the U.S. Customary System, metric system, and International System

A. Units of length

Units		*cm*	*m*	*in.*	*ft*	*yd*	*mi*
1 cm	= 1	0.01	0.3937008	0.03280840	0.01093613	6.213712×10^{-6}
1 m	= 100.	1	39.37008	3.280840	1.093613	6.213712×10^{-4}
1 in.	= 2.54	0.0254	1	0.08333333...	0.02777777...	1.578283×10^{-5}
1 ft	= 30.48	0.3048	12.	1	0.3333333...	$1.893939... \times 10^{-4}$
1 yd	= 91.44	0.9144	36.	3.	1	$5.681818... \times 10^{-4}$
1 mi	$= 1.609344 \times 10^{5}$	1.609344×10^{3}	6.336×10^{4}	5280.	1760.	1

B. Units of area

Units		cm^2	m^2	$in.^2$	ft^2	yd^2	mi^2
1 cm^2	= 1	10^{-4}	0.1550003	1.076391×10^{-3}	1.195990×10^{-4}	3.861022×10^{-11}
1 m^2	$= 10^{4}$	1	1550.003	10.76391	1.195990	3.861022×10^{-7}
1 $in.^2$	= 6.4516	6.4516×10^{-4}	1	$6.944444... \times 10^{-3}$	7.716049×10^{-4}	2.490977×10^{-10}
1 ft^2	= 929.0304	0.09290304	144.	1	0.1111111...	3.587007×10^{-8}
1 yd^2	= 8361.273	0.8361273	1296.	9.	1	3.228306×10^{-7}
1 mi^2	$= 2.589988 \times 10^{10}$	2.589988×10^{6}	4.014490×10^{9}	2.78784×10^{7}	3.0976×10^{6}	1

C. Units of volume

Units	m^3	cm^3	liter	$in.^3$	ft^3	qt	gal
1 m^3	= 1	10^6	10^3	6.102374×10^4	35.31467×10^{-3}	1.056688	264.1721
1 cm^3	= 10^{-6}	1	10^{-3}	0.06102374	3.531467×10^{-5}	1.056688×10^{-3}	2.641721×10^{-4}
1 liter	= 10^{-3}	1000.	1	61.02374	0.03531467	1.056688	0.2641721
1 $in.^3$	= 1.638706×10^{-5}	16.38706	0.01638706	1	5.787037×10^{-4}	0.01731602	4.329004×10^{-3}
1 ft^3	= 2.831685×10^{-2}	28316.85	28.31685	1728.	1	2.992208	7.480520
1 qt	= 9.463529×10^{-4}	946.3529	0.9463529	57.75	0.03342014	1	0.25
1 gal (U.S.)	= 3.785412×10^{-3}	3785.412	3.785412	231.	0.1336806	4.	1

D. Units of mass

Units	g	kg	oz	lb	metric ton	ton
1 g	= 1	10^{-3}	0.03527396	2.204623×10^{-3}	10^{-6}	1.102311×10^{-6}
1 kg	= 1000.	1	35.27396	2.204623	10^{-3}	1.102311×10^{-3}
1 oz (avdp)	= 28.34952	0.02834952	1	0.0625	2.834952×10^{-5}	3.125×10^{-5}
1 lb (avdp)	= 453.5924	0.4535924	16.	1	4.535924×10^{-4}	$5. \times 10^{-4}$
1 metric ton	= 10^8	1000.	35273.96	2204.623	1	1.102311
1 ton	= 907184.7	907.1847	32000.	2000.	0.9071847	1

Conversion factors for the U.S. Customary System, metric system, and International System (*cont.*)

E. Units of density

Units	$g \cdot cm^{-3}$	$g \cdot L^{-1}$, $kg \cdot m^{-3}$	$oz \cdot in.^{-3}$	$lb \cdot in.^{-3}$	$lb \cdot ft^{-3}$	$lb \cdot gal^{-1}$
1 g · cm^{-3}	= 1	1000.	0.5780365	0.03612728	62.42795	8.345403
1 g · L^{-1}, kg · m^{-3}	= 10^{-3}	1	5.780365×10^{-4}	3.612728×10^{-5}	0.06242795	8.345403×10^{-3}
1 oz · in.$^{-3}$	= 1.729994	1729.994	1	0.0625	108.	14.4375
1 lb · in.$^{-3}$	= 27.67991	27679.91	16.	1	1728.	231.
1 lb · ft^{-3}	= 0.01601847	16.01847	9.259259×10^{-3}	5.787037×10^{-4}	1	0.1336806
1 lb · gal^{-1}	= 0.1198264	119.8264	4.749536×10^{-3}	4.329004×10^{-3}	7.480519	1

F. Units of pressure

Units	Pa, N · m^{-2}	$dyn \cdot cm^{-2}$	*bar*	*atm*	$kgf \cdot cm^{-2}$	*mm*Hg (*torr*)	*in.* Hg	$lbf \cdot in.^{-2}$
1 Pa, 1 N · m^{-2}	= 1	10	10^{-5}	9.869233×10^{-6}	1.019716×10^{-5}	7.500617×10^{-3}	2.952999×10^{-4}	1.450377×10^{-4}
1 dyn · cm^{-2}	= 0.1	1	10^{-6}	9.869233×10^{-7}	1.019716×10^{-6}	7.500617×10^{-4}	2.952999×10^{-5}	1.450377×10^{-5}
1 bar	= 10^5	10^6	1	0.9869233	1.019716	750.0617	29.52999	14.50377
1 atm	= 101325	1013250	1.01325	1	1.033227	760.	29.92126	14.69595
1 kgf · cm^{-2}	= 98066.5	980665	0.980665	0.9678411	1	735.5592	28.95903	14.22334
1 mmHg (torr)	= 133.3224	1333.224	1.333224×10^3	1.315789×10^{-3}	1.359510×10^{-3}	1	0.03937008	0.01933678
1 in. Hg	= 3386.388	33863.88	0.03386388	0.03342105	0.03453155	25.4	1	0.4911541
1 lbf · in.$^{-2}$	= 6894.757	68947.57	0.06894757	0.06804596	0.07030696	51.71493	2.036021	1

G. Units of energy

Units	g mass (energy equiv)	J	eV	cal	cal_{IT}	Btu_{IT}	kWh	hp-h	ft-lbf	$ft^3 \cdot lbf \cdot in.^{-2}$	liter-atm
1 g mass (energy equiv)	= 1	8.987552 × 10^{13}	5.609589 × 10^{32}	2.148076 × 10^{3}	2.146640 × 10^{13}	8.518555 × 10^{10}	2.496542 × 10^{7}	3.347918 × 10^{7}	6.628878 × 10^{13}	4.603388 × 10^{11}	8.870024 × 10^{11}
1 J	= 1.112650 × 10^{-14}	1	6.241510 × 10^{18}	0.2390057	0.2388459	9.478172 × 10^{-4}	2.777777... × 10^{-7}	3.725062	0.7375622	5.121960 × 10^{-3}	9.869233 × 10^{-3}
1 eV	= 1.782662 × 10^{-33}	1.602176 × 10^{-19}	1	3.829293 × 10^{-20}	3.826733 × 10^{-20}	1.518570 × 10^{-22}	4.450490 × 10^{-26}	5.968206 × 10^{-26}	1.181705 × 10^{-19}	8.206283 × 10^{-22}	1.581225 × 10^{-21}
1 cal	= 4.655328 × 10^{-14}	4.184	2.611448 × 10^{19}	1	0.9993312	3.965667 × 10^{-3}	1.1622222... × 10^{-6}	1.558562 × 10^{-6}	3.085960	2.143028 × 10^{-2}	0.04129287
1 cal_{IT}	= 4.658443 × 10^{-14}	4.1868	2.613195 × 10^{19}	1.000669	1	3.968321 × 10^{-3}	1.163 × 10^{-6}	1.559609 × 10^{-6}	3.088025	2.144462 × 10^{-2}	0.04132050
1 Btu_{IT}	= 1.173908 × 10^{-11}	1055.056	6.585141 × 10^{21}	252.1644	251.9958	1	2.930711 × 10^{-4}	3.930148 × 10^{-4}	778.1693	5.403953	10.41259
1 kWh	= 4.005540 × 10^{-8}	3600000.	2.246944 × 10^{25}	860420.7	859845.2	3412.142	1	1.341022	2655224.	18349.06	35529.24
1 hp-h	= 2.986931 × 10^{-8}	2384519.	1.675545 × 10^{25}	641615.6	641186.5	2544.33	0.7456998	1	1980000.	13750.	26494.15
1 ft-lbf	= 1.508551 × 10^{-14}	1.355818	8.462351 × 10^{18}	0.3240483	0.3238315	1.285067 × 10^{-3}	3.766161 × 10^{-7}	5.050505... × 10^{-7}	1	6.944444... × 10^{-3}	0.01338088
1 ft^3 lbf · $in.^{-2}$	= 2.172313 × 10^{-12}	195.2378	1.218579 × 10^{21}	46.66295.	46.63174	0.1850497	5.423272 × 10^{-5}	7.272727... × 10^{-5}	144.	1	1.926847
1 liter-atm	= 1.127393 × 10^{-12}	101.325	6.324210 × 10^{20}	24.21726	24.20106	0.09603757	2.814583 × 10^{-5}	3.774419 × 10^{-5}	74.73349	0.5189825	1

Appendix

Special constants

$\pi = 3.14159\ 26535\ 89793\ 23846\ 2643\ \ldots$

$e = 2.71828\ 18284\ 59045\ 23536\ 0287\ \ldots = \lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n$

$=$ natural base of logarithms

$\sqrt{2} = 1.41421\ 35623\ 73095\ 0488\ \ldots$

$\sqrt{3} = 1.73205\ 08075\ 68877\ 2935\ \ldots$

$\sqrt{5} = 2.23606\ 79774\ 99789\ 6964\ \ldots$

$\sqrt[3]{2} = 1.25992\ 1050\ \ldots$

$\sqrt[3]{3} = 1.44224\ 9570\ \ldots$

$\sqrt[5]{2} = 1.14869\ 8355\ \ldots$

$\sqrt[5]{3} = 1.24573\ 0940\ \ldots$

$e^{\pi} = 23.14069\ 26327\ 79269\ 006\ \ldots$

$\pi^{e} = 22.45915\ 77183\ 61045\ 47342\ 715\ \ldots$

$e^{e} = 15.15426\ 22414\ 79264\ 190\ \ldots$

$\log_{10} 2 = 0.30102\ 99956\ 63981\ 19521\ 37389\ \ldots$

$\log_{10} 3 = 0.47712\ 12547\ 19662\ 43729\ 50279\ \ldots$

$\log_{10} e = 0.43429\ 44819\ 03251\ 82765\ \ldots$

$\log_{10} \pi = 0.49714\ 98726\ 94133\ 85435\ 12683\ \ldots$

$\log_{e} 10 = \ln 10 = 2.30258\ 50929\ 94045\ 68401\ 7991\ \ldots$

$\log_{e} 2 = \ln 2 = 0.69314\ 71805\ 59945\ 30941\ 7232\ \ldots$

$\log_{e} 3 = \ln 3 = 1.09861\ 22886\ 68109\ 69139\ 5245\ \ldots$

$\gamma = 0.57721\ 56649\ 01532\ 86060\ 6512\ \ldots =$ Euler's constant

$= \lim_{n\to\infty}\left(1+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{n}-\ln n\right)$

$e^{\gamma} = 1.78107\ 24179\ 90197\ 9852\ \ldots$

$\sqrt{e} = 1.64872\ 12707\ 00128\ 1468\ \ldots$

$\sqrt{\pi} = \Gamma(\frac{1}{2}) = 1.77245\ 38509\ 05516\ 02729\ 8167\ \ldots$

where Γ is the gamma function

$\Gamma(\frac{1}{3}) = 2.67893\ 85347\ 07748\ \ldots$

$\Gamma(\frac{1}{4}) = 3.62560\ 99082\ 21908\ \ldots$

$1 \text{ radian} = 180°/\pi = 57.29577\ 95130\ 8232\ \ldots°$

$1° = \pi/180 \text{ radians} = 0.01745\ 32925\ 19943\ 29576\ 92\ \ldots \text{ radians}$

SOURCE: Murray R. Spiegel and John Liu, *Mathematical Handbook of Formulas and Tables*, 2d ed., Schaum's Outline Series, McGraw-Hill, 1999.

Electrical and magnetic units

Quantity	*Unit and symbol*	*Derivation*
SI base units		
Mass	kilogram, kg	
Time	second, s	
Length	meter, m	
Electric current	ampere, A	
Thermodynamic temperature	kelvin, K	
Luminous intensity	candela, cd	
Amount of substance	mole, mol	
Derived units		
Potential difference, emf	vol, V	$W \cdot A^{-1} = m^2 \cdot kg \cdot s^{-3} \cdot A^{-1}$
Resistance	ohm, Ω	$V \cdot A^{-1} = m^2 \cdot kg \cdot s^{-3} \cdot A^{-2}$
Electric charge	coulomb, C	$s \cdot A$
Capacitance	farad, F	$C \cdot V^{-1} = m^{-2} \cdot kg^{-1} \cdot s^4 \cdot A^2$
Conductance	siemens, S	$A \cdot V^{-1} = m^{-2} \cdot kg^{-1} \cdot s^3 \cdot A^2$
Magnetic flux	weber, Wb	$V \cdot s = m^2 \cdot kg \cdot s^{-2} \cdot A^{-1}$
Inductance	henry, H	$Wb \cdot A^{-1} = m^2 \cdot kg \cdot s^{-2} \cdot A^{-2}$
Magnetic flux density	tesla, T	$Wb \cdot m^{-2} = kg \cdot s^{-2} \cdot A^{-1}$
Magnetic field strength	ampere per meter	$m^{-1} \cdot A$
Current density	ampere per square meter	$m^{-2} \cdot A$
Electric field strength	volt per meter	$V \cdot m^{-1} = m \cdot kg \cdot s^{-3} \cdot A^{-1}$
Permittivity	farad per meter	$F \cdot m^{-1} = m^{-3} \cdot kg^{-1} \cdot s^4 \cdot A^2$
Permeability	henry per meter	$H \cdot m^{-1} = m \cdot kg \cdot s^{-2} \cdot A^{-2}$

Dimensional formulas of common quantities

Quantity	*Definition*	*Dimensional formula*
Mass	Fundamental	M
Length	Fundamental	L
Time	Fundamental	T
Velocity	Distance/time	LT^{-1}
Acceleration	Velocity/time	LT^{-2}
Force	Mass × acceleration	MLT^{-2}
Momentum	Mass × velocity	MLT^{-1}
Energy	Force × distance	ML^2T^{-2}
Angle	Arc/radius	I
Angular velocity	Angle/time	T^{-1}
Angular acceleration	Angular velocity/time	T^{-2}
Torque	Force × lever arm	ML^2T^{-2}
Angular momentum	Momentum × lever arm	ML^2T^{-1}
Moment of inertia	Mass × radius squared	ML^2
Area	Length squared	L^2
Volume	Length cubed	L^3
Density	Mass/volume	ML^{-3}
Pressure	Force/area	$ML^{-1}T^{-2}$
Action	Energy × time	ML^2T^{-1}
Viscosity	Force per unit area per unit velocity gradient	$ML^{-1}T^{-1}$

Appendix

Internal energy and generalized work

Type of energy	*Intensive factor*	*Extensive factor*	*Element of work*
Mechanical			
Expansion	Pressure (P)	Volume (V)	$-P\,dV$
Stretching	Surface tension (γ)	Area (A)	$\gamma\,dA$
Extension	Tensile stretch (F)	Length (l)	$F\,dl$
Thermal	Temperature (T)	Entropy (S)	$T\,dS$
Chemical	Chemical potential (gm)	Moles (n)	$\mu\,dn$
Electrical	Electric potential (E)	Charge (Q)	$E\,dQ$
Gravitational	Gravitational field strength (mg)	Height (h)	$mg\,dh$
Polarization			
Electrostatic	Electric field strength (E)	Total electric polarization (P)	$E\,dP$
Magnetic	Magnetic field strength (H)	Total magetic polarization (M)	$H\,dM$

General rules of integration*

$$\int a\,dx = ax$$

$$\int af(x)\,dx = a\int f(x)\,dx$$

$$\int (u \pm v \pm w \pm \cdots)\,dx = \int u\,dx \pm \int v\,dx \pm \int w\,dx \pm \cdots$$

$$\int u\,dv = uv - \int v\,du \qquad \text{[integration by parts]}$$

$$\int f(ax)\,dx = \frac{1}{a}\int f(u)\,du$$

$$\int F\{f(x)\}\,dx = \int F(u)\,\frac{dx}{du}\,du = \int \frac{F(u)}{f'(x)}\,du \qquad \text{where } u = f(x)$$

$$\int u^n\,du = \frac{u^{n+1}}{n+1}, \qquad n \neq -1 \qquad \text{[for } n = -1\text{]}$$

$$\int \frac{du}{u} = \ln u \qquad \text{if } u > 0 \text{ or } \ln(-u) \text{ if } u < 0$$

$$= \ln |u|$$

$$\int e^u\,du = e^u$$

$$\int a^u\,du = \int e^{u \ln a}\,du = \frac{e^{u \ln a}}{\ln a} = \frac{a^u}{\ln a}, \qquad a > 0,\ a \neq 1$$

$$\int \sin u\,du = -\cos u$$

$$\int \cos u\,du = \sin u$$

$$\int \tan u\,du = \ln \sec u = -\ln \cos u$$

$$\int \cot u\,du = \ln \sin u$$

$$\int \sec u\,du = \ln (\sec u + \tan u) = \ln \tan\left(\frac{u}{2} + \frac{\pi}{4}\right)$$

$$\int \csc u\,du = \ln (\csc u - \cot u) = \ln \tan \frac{u}{2}$$

$$\int \sec^2 u\,du = \tan u$$

$$\int \csc^2 u\,du = -\cot u$$

$$\int \tan^2 u\,du = \tan u - u \qquad \int \cot^2 u\,du = -\cot u - u$$

$$\int \sin^2 u\,du = \frac{u}{2} - \frac{\sin 2u}{4} = \frac{1}{2}(u - \sin u \cos u)$$

$$\int \cos^2 u\,du = \frac{u}{2} + \frac{\sin 2u}{4} = \frac{1}{2}(u + \sin u \cos u)$$

$$\int \sec u \tan u\,du = \sec u$$

$$\int \csc u \cot u\,du = -\csc u$$

$$\int \sinh u\,du = \cosh u$$

$$\int \cosh u\,du = \sinh u$$

$$\int \tanh u\,du = \ln \cosh u$$

$$\int \coth u\,du = \ln \sinh u$$

General rules of integration* (cont.)

$$\int \operatorname{sech} u\,du = \sin^{-1}(\tanh u) \quad \text{or} \quad 2\tan^{-1}e^{u}$$

$$\int \operatorname{csch} u\,du = \ln\tanh\frac{u}{2} \quad \text{or} \quad -\coth^{-1}e^{u}$$

$$\int \operatorname{sech}^2 u\,du = \tanh u$$

$$\int \operatorname{csch}^2 u\,du = -\coth u$$

$$\int \tanh^2 u\,du = u - \tanh u$$

$$\int \coth^2 u\,du = u - \coth u$$

$$\int \sinh^2 u\,du = \frac{\sinh 2u}{4} - \frac{u}{2} = \frac{1}{2}(\sinh u\cosh u - u)$$

$$\int \cosh^2 u\,du = \frac{\sinh 2u}{4} + \frac{u}{2} = \frac{1}{2}(\sinh u\cosh u + u)$$

$$\int \operatorname{sech} u\tanh u\,du = -\operatorname{sech} u$$

$$\int \operatorname{csch} u\coth u\,du = -\operatorname{csch} u$$

$$\int \frac{du}{u^2+a^2} = \frac{1}{a}\tan^{-1}\frac{u}{a}$$

$$\int \frac{du}{u^2-a^2} = \frac{1}{2a}\ln\left(\frac{u-a}{u+a}\right) = -\frac{1}{a}\coth^{-1}\frac{u}{a} \quad u^2 > a^2$$

$$\int \frac{du}{a^2-u^2} = \frac{1}{2a}\ln\left(\frac{a+u}{a-u}\right) = \frac{1}{a}\tanh^{-1}\frac{u}{a} \quad u^2 < a^2$$

$$\int \frac{du}{\sqrt{a^2-u^2}} = \sin^{-1}\frac{u}{a}$$

$$\int \frac{du}{\sqrt{u^2+a^2}} = \ln(u+\sqrt{u^2+a^2}) \quad \text{or} \quad \sinh^{-1}\frac{u}{a}$$

$$\int \frac{du}{\sqrt{u^2-a^2}} = \ln(u+\sqrt{u^2-a^2})$$

$$\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\sec^{-1}\left|\frac{u}{a}\right|$$

$$\int \frac{du}{u\sqrt{u^2+a^2}} = -\frac{1}{a}\ln\left(\frac{a+\sqrt{u^2+a^2}}{u}\right)$$

$$\int \frac{du}{u\sqrt{a^2-u^2}} = -\frac{1}{a}\ln\left(\frac{a+\sqrt{a^2-u^2}}{u}\right)$$

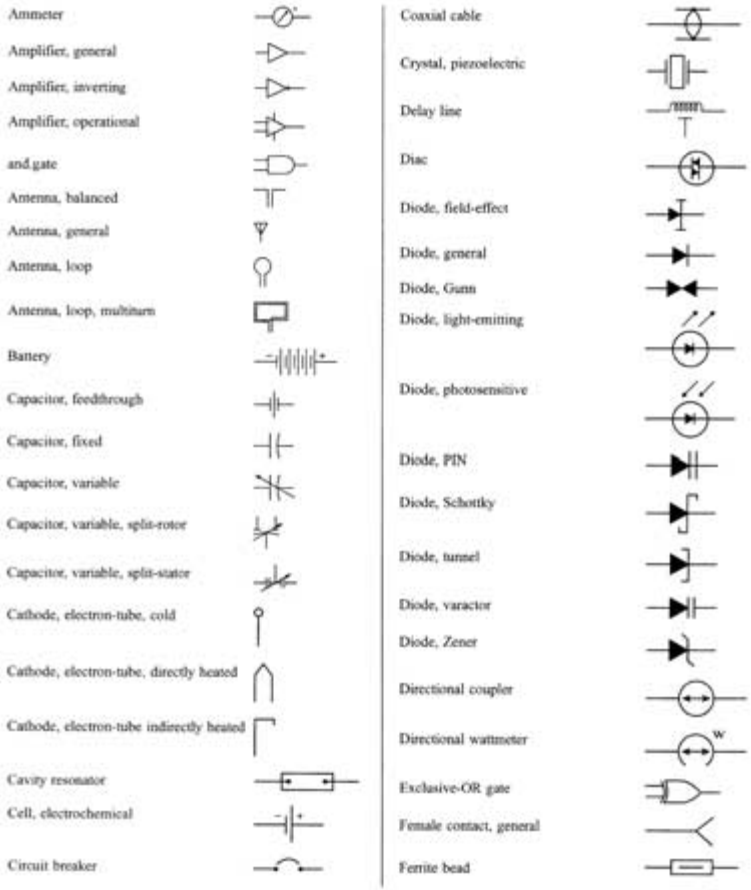
$$\int f^{(n)}g\,dx = f^{(n-1)}g - f^{(n-2)}g' + f^{(n-3)}g'' - \cdots (-1)^n \int fg^{(n)}\,dx$$

This is called generalized integration by parts.

*Here, u, v, w are functions of x; a, b, p, q, n any constants, restricted if indicated; $e = 2.71828\ldots$ is the natural base of logarithms; $\ln u$ denotes the natural logarithm of u where it is assumed that $u > 0$ [in general, to extend formulas to cases where $u < 0$ as well, replace $\ln u$ by $\ln|u|$]; all angles are in radians; all constants of integration are omitted but implied.

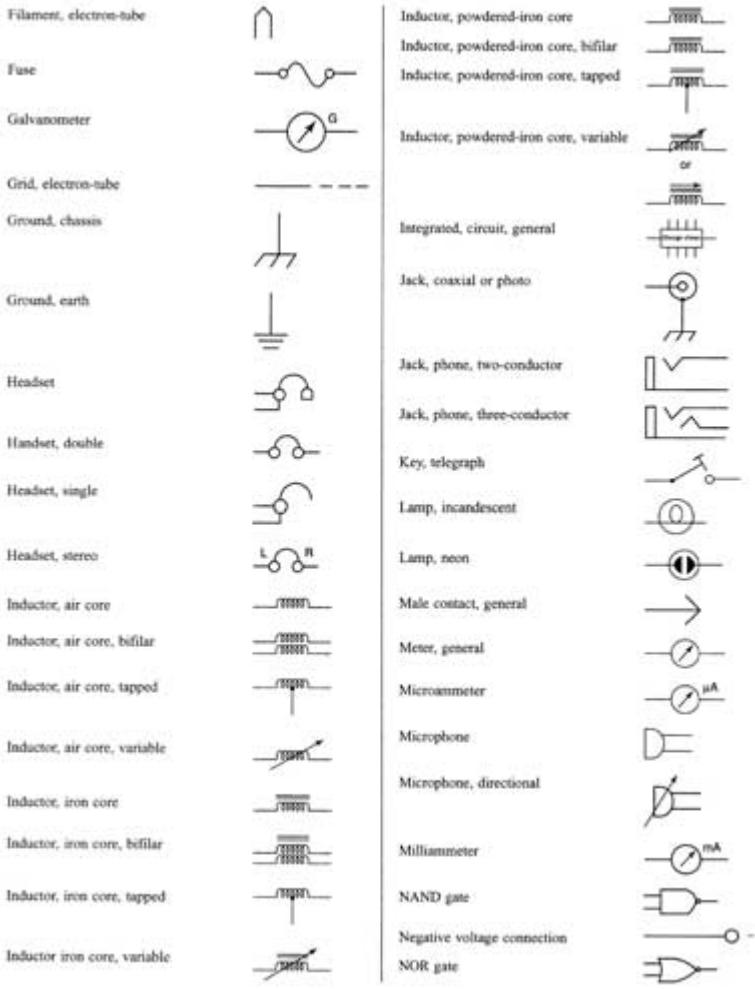
SOURCE: Murray R. Spiegel and John Liu, *Mathematical Handbook of Formulas and Tables*, 2d ed., Schaum's Outline Series, McGraw-Hill, 1999.

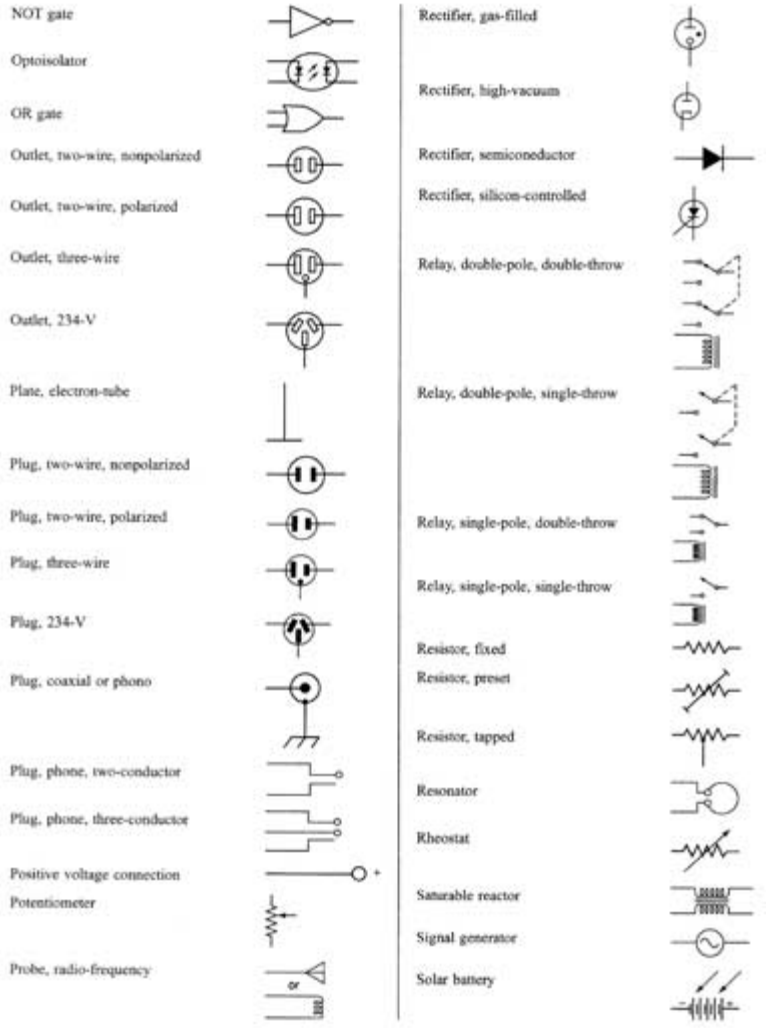
Schematic electronic symbols*



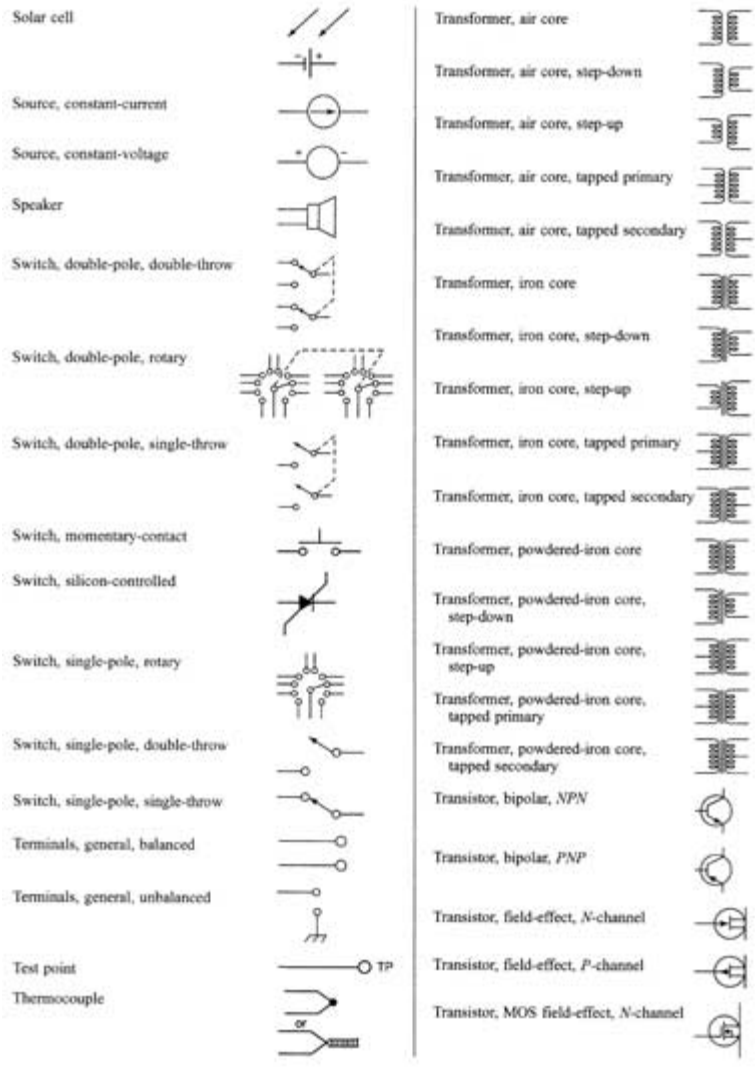
*From S. Gibilisco, *The Illustrated Dictionary of Electronics*, 8th ed., McGraw-Hill, 2001.

Appendix


Filament, electron-tube
Fuse
Galvanometer
G
Grid, electron-tube
Ground, chassis
Ground, earth
Headset
Handset, double
Headset, single
Headset, stereo
L
R
Inductor, air core
Inductor, air core, bifilar
Inductor, air core, tapped
Inductor, air core, variable
Inductor, iron core
Inductor, iron core, bifilar
Inductor, iron core, tapped
Inductor iron core, variable
Inductor, powdered-iron core
Inductor, powdered-iron core, bifilar
Inductor, powdered-iron core, tapped
Inductor, powdered-iron core, variable
or
Integrated, circuit, general
Jack, coaxial or photo
Jack, phone, two-conductor
Jack, phone, three-conductor
Key, telegraph
Lamp, incandescent
Lamp, neon
Male contact, general
Meter, general
Microammeter
μA
Microphone
Microphone, directional
Milliammeter
mA
NAND gate
Negative voltage connection
NOR gate


NOT gate
Optoisolator
OR gate
Outlet, two-wire, nonpolarized
Outlet, two-wire, polarized
Outlet, three-wire
Outlet, 234-V
Plate, electron-tube
Plug, two-wire, nonpolarized
Plug, two-wire, polarized
Plug, three-wire
Plug, 234-V
Plug, coaxial or phono
Plug, phone, two-conductor
Plug, phone, three-conductor
Positive voltage connection
+
Potentiometer
Probe, radio-frequency
or
Rectifier, gas-filled
Rectifier, high-vacuum
Rectifier, semiconductor
Rectifier, silicon-controlled
Relay, double-pole, double-throw
Relay, double-pole, single-throw
Relay, single-pole, double-throw
Relay, single-pole, single-throw
Resistor, fixed
Resistor, preset
Resistor, tapped
Resonator
Rheostat
Saturable reactor
Signal generator
Solar battery

Appendix


Solar cell
Source, constant-current
Source, constant-voltage
Speaker
Switch, double-pole, double-throw
Switch, double-pole, rotary
Switch, double-pole, single-throw
Switch, momentary-contact
Switch, silicon-controlled
Switch, single-pole, rotary
Switch, single-pole, double-throw
Switch, single-pole, single-throw
Terminals, general, balanced
Terminals, general, unbalanced
Test point
TP
Thermocouple
or
Transformer, air core
Transformer, air core, step-down
Transformer, air core, step-up
Transformer, air core, tapped primary
Transformer, air core, tapped secondary
Transformer, iron core
Transformer, iron core, step-down
Transformer, iron core, step-up
Transformer, iron core, tapped primary
Transformer, iron core, tapped secondary
Transformer, powdered-iron core
Transformer, powdered-iron core, step-down
Transformer, powdered-iron core, step-up
Transformer, powdered-iron core, tapped primary
Transformer, powdered-iron core, tapped secondary
Transistor, bipolar, NPN
Transistor, bipolar, PNP
Transistor, field-effect, N-channel
Transistor, field-effect, P-channel
Transistor, MOS field-effect, N-channel

Transistor, MOS field-effect, *P*-channel

Transistor, photosensitive, *NPN*

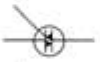
Transistor, photosensitive, *PNP*

Transistor, photosensitive, field-effect, *N*-channel

Transistor, photosensitive, field-effect, *P*-channel

Transistor, unijunction

Triac



Tube, diode

Tube, heptode

Tube, hexode

Tube, pentode

Tube, photosensitive

Tube, tetrode

Tube, triode

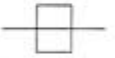
Voltmeter

Wattmeter

Waveguide, circular

Waveguide, flexible

Waveguide, rectangular



Waveguide, twisted

Wires, crossing, connected

Wires, crossing, not connected