

# Academic Press Dictionary of Science and Technology





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Edited by  
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**Dutch metal** *Metallurgy*. a copper-base alloy containing 15% zinc, rolled to foil; used as an inexpensive substitute for gold.

**Dutch process** *Chemical Engineering*. a procedure for creating white lead, in which metallic lead in containers corrodes due to the action of acetic acid and carbon dioxide, which are produced by the fermenting tanbark and manure into which the containers have been placed.

**duty** *Hydrology*. see DUTY OF WATER.

**duty cycle** *Engineering*. **1.** the amount of time it takes to start, operate, stop, and idle a machine when it is being used for intermittent duty. **2.** a percentage that expresses the amount of working time as compared to the total operating time of an intermittently working piece of equipment. *Electronics*. the ratio of the "on" period of a pulse to the total pulse period. *Nucleonics*. the fraction of time that a useful beam is available at full power in a particle accelerator. *Telecommunications*. the daily schedule of a radio transmission station.

**duty cyclometer** *Engineering*. an instrument that records the operation of a duty cycle.

**duty of water** *Agriculture*. the relationship between the quantity of water used in irrigating an area and the size of the area or the amount of crops produced there.

**duty ratio** *Electronics*. **1.** the ratio of the time an intermittently operating device is working to the total time available. **2.** the ratio of average to peak power in a pulsed system.

**Du Vigneaud, Vincent** [dù ven'yo'] 1901–1978, American biochemist; Nobel Prize for research on pituitary hormones.

**DV or D.V.** double vibrations. Also, **dv** or **d.v.**

**D value** *Microbiology*. the time required to decrease the number of viable microorganisms at a given temperature to a given percentage, usually 10%, of the original number.

**D variometer** declination variometer.

**DVM or dvm** digital voltmeter.

**DVM or D.V.M.** Doctor of Veterinary Medicine.

**DVS or D.V.S.** Doctor of Veterinary Science.

**DVST or dvst** direct-view storage tube.

**DW or dw** deadweight; distilled water.

**dwarf** *Biology*. an animal or plant that is significantly shorter or smaller than others of its species, often having abnormal proportions as well, and for which there is no expectation of growth to the normal size. *Medicine*. specifically, a markedly undersized person; especially one whose bodily proportions are abnormal. *Astronomy*. see DWARF STAR.

**dwarf Cepheid** *Astronomy*. a pulsating variable star having a period of less than 6 hours and a type A or F spectrum.

**dwarf disease** *Plant Pathology*. a virus disease of blackberries, plum trees, and other plants that causes a reduction in growth and fruit production.

**dwarf dud** *Ordnance*. any nuclear weapon that fails to provide a yield within reasonable range of that expected with normal operation.

**dwarf galaxy** *Astronomy*. a galaxy having a small mass and low luminosity.

**dwarfing** *Plant Pathology*. an underdevelopment of a plant or plant part, caused by various types of disease agents or by faulty nutrition.

**dwarfism** *Medicine*. abnormal underdevelopment of the body; the condition of being undersized, especially with a lack of normal proportion.

**dwarf nova** see CATAclysmic VARIABLE.

**dwarf star** *Astronomy*. a star on the main sequence of the Hertzsprung-Russell diagram.

**dwell** *Design Engineering*. the part of a cam that allows the cam follower to remain at maximum lift for an extended period of time.

*Robotics*. a programmed delay in the working cycle of a robot.

**dwell time** *Transportation Engineering*. the duration of a station stop, or of all station stops during a given trip. *Metallurgy*. in powder metallurgy, the time elapsed during the application of the maximum pressure.

**dwigh** [dwi] *Meteorology*. **1.** a sudden shower or snow flurry along the coast of Newfoundland. **2.** any coastal squall. Also, **dwy**, **dwey**, **dwoy**.

**DWT or dwt** deadweight ton; deadweight tonnage.

**dwt** pennyweight.

**DX** *Aviation*. the airline code for Danair.

**DX** distance; distance reception; direct expansion.

**Dx** diagnosis.

**Dy** the chemical symbol for dysprosium.

**dyad** *Cell Biology*. a double chromosome arising from the halving of a tetrad during the first meiotic division. *Mathematics*. a decomposable, contravariant 2-tensor; i.e., a contravariant 2-tensor whose  $(i,j)$ th component is the product of the  $i$ th component of the first vector and the  $j$ th component of the second.

*dyadic Cell Biology*. of or relating to a dyad. *Mathematics*. an addition of two or more dyads.

**dyadic expansion** *Mathematics*. the representation of a number in base two. Also, BINARY REPRESENTATION.

**dyadic operation** *Mathematics*. any operation that requires two operands, such as addition or subtraction; a binary operation. *Computer Programming*. also, **dyadic Boolean operation**. a logic operation that uses two operands.

**dyadic processor** *Computer Technology*. a multiprocessor system in which two processors are under the control of the same operating system.

**dyadic rational** *Mathematics*. a rational number of the form  $a/2^n$ , where  $a$  and  $n$  are integers and  $n$  is nonnegative.

**Dyar's rule** *Entomology*. a law based on the observation that certain caterpillar parts grow in geometric progression, increasing in size by a constant ratio at each moult; used to deduce facts about the life history of an insect for which other information is lacking.

**Dyazide** *Pharmacology*. a trade name for a preparation of triamterene with hydrochlorothiazide, used in the treatment of hypertension and edema.

**dye** *Chemistry*. a natural or synthetic substance that is used in solution to impart color to another substance; distinguished from a pigment, which is used in suspension.

**dycrete process** *Engineering*. a process in which organic dyes are used to permanently color concrete.

**dyeing** *Chemical Engineering*. the process of applying a color-producing agent to a material.

**dyeing assistant** *Chemistry*. any material that is used in a dyeing procedure to promote or control the actions of the dye.

**dye penetrant** *Metallurgy*. a liquid used to reveal fine cracks in a metallic component.

**dyestuff** *Materials*. any substance that yields or is used as a dye.

**dyn.** dynamics; dyne; dynes.

**dyna-** a combining form meaning "power," as in *dynatron*.

**dynam-** a combining form meaning "power," as in *dynamite*.

**dynam.** dynamics.

**dynamic** *Mechanics*. of or relating to the science of dynamics. *Physics*.

**1.** relating to or manifesting force or power. **2.** of or relating to bodies in motion or to motion in general. **3.** describing any system that changes over time. *Acoustical Engineering*. **1.** of or relating to the range of volume of musical sound. **2.** describing an acoustical device, such as a loudspeaker or microphone, that derives electroacoustic energy from some form of motion. *Computer Technology*. of programming, processing, memory, or the like, affected by the passage of time or by the variations in power input. Also, **dynamical**.

**dynamic accuracy** *Control Systems*. in an automatic control system, the difference between the actual position and the position desired or commanded.

**dynamic address translator** *Computer Technology*. in a virtual memory system, a hardware device that uses a memory mapping table to specify the correspondence between the virtual address and the real address. Also, RELOCATION HARDWARE.

**dynamical diffraction** *Crystallography*. diffraction theory in which the modification of the primary beam on passage through the crystal is important. The mutual interactions of the incident and scattered beams are taken into account; this is important for perfect crystals and for electron diffraction by crystals.

**dynamical equinox** *Astronomy*. the intersection of the ecliptic with the celestial equator where the Sun is moving from south to north.

**dynamical friction** *Physics*. **1.** the friction between two materials rubbing against each other. **2.** the drag force between electrons and ions drifting with respect to one another.

**dynamic algorithm** *Computer Programming*. an algorithm including parameters that are determined by computations and logical comparisons during program execution.

**dynamical halo model** *Astrophysics*. a model to explain the propagation of cosmic rays, postulating that they originate in the galactic disk and diffuse outward and inward in a dynamical galactic halo.

**dynamical mean sun** *Navigation*. a fictitious sun that moves at a constant rate; used in calculating the equation of time.

**dynamical system** *Mathematics*. in the calculus of variations, an optimization problem in which the state of an object is described by a system of ordinary differential equations.

**dynamical time** *Astronomy*. the system of uniform time scales now