

The New Penguin Dictionary of
Civil Engineering

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resins. It is the *binder*, the *matrix*, in fibre reinforced plastic. For epoxy resin see *epoxy*. Resin coating is epoxy-coated steel. Resin content is the amount of resin in a laminant expressed as a percentage by weight or total volume. For resin concrete see *polymer*. Resin tearing is the separation of cosmetic pigments in a *gelcoat*. Resin transfer moulding is a moulding process in which catalysed resin is injected into a closed mould already containing the pre-formed reinforcement. A resin rich area is filled with resin and lacks reinforcing material. A resin starved area is the opposite.

resistance An opposition to flow through a loss of energy. Resistance [hydr.] to the flow of fluid e.g. through a pipe or channel can be caused by friction and/or drag and is usually expressed in metres of head of water. Resistance [elec.] to a flow of electric current heats an electrical conductor, e.g. an electric heater. Resistance in structures is *damping*.

resistivity [elec.] A quantity defined, for a wire of resistance R , length l and area A , as $R \times A/l$. Resistivity is the inverse of electrical conductivity. Resistivity logging is a method of logging a well, e.g. in a *borehole*. The resistivity of the rocks drilled is found by applying an electric voltage to a drilling fluid in an uncased hole. Wet clays have low resistivity whereas granites have very high resistivity.

resolution 1 Separating or reducing something into its parts such as a substance or compound into its constituent substances or elements. See also *resolution of force*. **2** The accuracy at which the location and shape of map features can be shown. As map scale decreases, resolution also diminishes because feature boundaries must be smoothed, simplified or not shown at all.

resolution of force [stru.] Also resolving of force. Representing a *force* of given magnitude and direction in two or three coordinate directions.

resonance [stru.] A condition in which a system vibrates with maximum *amplitude* when the *frequency* of the exciting force

coincides with the natural *undamped* frequency of the system. For example when pushing a child's swing, one learns to push in time with the natural frequency. In structures, such a condition can result in dangerously large oscillations. See also *synchronous lateral excitation*.

resorcinol-formaldehyde (RF) Similarly, **phenol-resorcinol-formaldehyde (PRF)**. A structural wood adhesive that is strong and durable, fully water-, boil- and weather-resistant and resists exposure to salt water. Used in *laminated beams* and *arches*, *finger-jointed timber*, *I-beams*, *box beams gusset joints* etc. both indoors and outdoors. Cf. *phenol-formaldehyde*.

resource [mgmt] Materials, equipment, people and other assets useful for particular reasons. The greatest asset of most companies is its employees.

respirator 1 Apparatus that artificially maintains respiration and is usually worn over the head or face to protect from smoke, fumes and other gases, often used by rescue workers and firefighters. **2** The filtering device in such equipment. **3** Apparatus for testing exhaled air.

response Doing something in reply or something happening as a reaction, e.g. the **structural response** to a *load* is a *deformation* which may be characterized by *displacements*, *strains* and *stresses*. A **response signal** is that from a response sensor that measures the response of a system to an input, e.g. a *vibration* or *shock*. A **response spectrum** is a plot of the maximum response (acceleration, velocity, displacement) of a set of single *degree of freedom* oscillators (e.g. producing mass on a spring – *harmonic motion* type oscillations) as a function of their natural frequencies when subjected to a particular *dynamic load* (input vibration). A **response time** is that required for a step change in an input signal to affect an output response signal and stay at the expected level $\pm$ some specified difference.

responsibility Influential word [syst.] The obligation to carry out specified duties and tasks as a role within a process