

A

ACCELERATOR

A material added to concrete to shorten the set time by increasing the rate of hydration.

ADMIXTURE

A material (such as a plasticizer) added to concrete in smaller quantities. Referred to as an admix or additive.

AERATED CONCRETE

Lightweight, carvable concrete with a uniform cellular structure (like a sponge), usually made from a mixture of Portland cement, sand, and a gas-forming agent such as aluminum, or an introduced foam. Commercial aerated concrete is steam-cured under pressure.

AGGREGATES

Inert granular materials such as sand, gravel or crushed stone that account for up to 75% of the total value of concrete.

AIR ENTAINER

An admixture that traps tiny bubbles of air in the concrete mix to improve frost resistance.

ALKALINE

Describes a material with a pH of over 7. Alkaline materials are also described as basic or caustic. Alkaline materials can neutralize acidic ones.

ARMATURE

A metal framework on which concrete is placed to make a sculpture or other object.

B

BLAST FURNACE SLAG

Ground, granulated blast furnace slag (GGBFS) is a recycled product. One of several *pozzolans* that can be added to concrete.

C

CALCIUM HYDROXIDE

One of the two main products resulting from the hydration of Portland cement. It is commonly known as slaked lime and can burn the skin. The other is calcium silicate hydrate.

CALCIUM SILICATE HYDRATE

The main binding material in concrete, resulting from the hydration of Portland cement.

CAUSTIC

Capable of burning organic tissue; strongly alkaline.

CEMENT

Any substance used to make things stick together. Portland cement defined as the fine grey powder that is made by burning limestone and clay. Calcium silicates are the active part of cement; they chemically combine with water to bind all the aggregates together.

CEMENT PASTE

A mixture of cement and water.

CEMENTITIOUS

Having cement-like properties. Pozzolans react with calcium hydroxide in concrete to make cementitious materials.

CONCRETE

A mixture of crushed stone, sand, cement and water that hardens as a result of chemical reactions between the cement and water. "Concrete" means the wet mixture and also the hard material that results when it sets.

CURING

The process of letting concrete develop strength by keeping it damp and within the correct temperature range, usually for at least a week.

E

EXPANDED LATH OR METAL

Galvanized steel that has been slit in a regular pattern and stretched; used as reinforcement for stucco.



F

FALSE SET

An initial rapid hardening of concrete, not caused by heat or accelerators. The concrete can be remixed and used. Not to be confused with a true *initial set*.

FERRO-CEMENT OR FERROCONCRETE

A form of reinforced concrete using closely spaced multiple layers of steel mesh or small rods completely encased in a cement-sand mix.

FINAL SET

An arbitrary point at which concrete has hardened or become rigid. (See *initial set*.)

FLY ASH

A fine-grained glassy powder collected from the flue gases of coal-burning power plants. One of several *pozzolans* that can be added to concrete.

FORM

The shape of something, apart from its colour and material.

H

HARDWARE CLOTH

A heavy-duty screening made from galvanized steel wire.

HYDRATION

In concrete, the chemical reaction between Portland cement and water. The longer concrete is kept damp, the longer the hydration will occur and the stronger the concrete will be.

I

INITIAL SET

The first stiffening or hardening that takes place after concrete is mixed. This usually takes place in the first four to eight hours. (See *false set* and *final set*.)

L

LIME

Calcium oxide. In cement the term usually means slaked lime (calcium hydroxide), a caustic substance. Lime is often an ingredient in mortar.

LIMESTONE

A sedimentary rock consisting mainly of calcium carbonate.

M

MARBLE

A form of limestone (calcium carbonate) in a metamorphic crystalline state.

METAKAOLIN

A white kaolin clay that has been heat-treated. One of several *pozzolans* that can be added to concrete to increase strength and workability.

MORTAR

A mixture of cement, sand and water. Mortar that is used for laying bricks or stones sometimes has added lime.

MOULD

A hollow shape in which something is cast. Moulds can be made of any material, the common ones being metal, wood and plaster.

P

PERLITE

A type of volcanic glass that is expanded by heating, and used as a planting medium, an insulation, and to make lightweight concrete.

PERMEABILITY

The ability of a material to allow gas or water vapour to pass through it. Denser concrete has a higher impermeability.



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PH

A chemical value measuring the acidity or alkalinity of a substance. A pH of 7 is neutral. Under 7 is acidic; over 7 is alkaline. Wet Portland cement has a pH of 10 to 12.

PLASTICIZER/WATER REDUCER (SUPERPLASTICIZER)

An admixture that increases the workability of concrete, allowing less water in the mix.

POLYMER CONCRETE

A concrete in which aggregates and minerals are held together by polymer resins, usually polyester, acrylic or epoxy, replacing some or all of the Portland cement in the mix. This is done to increase moisture resistance and strength.

POLYSTYRENE

A rigid expanded plastic foam that can be used as a basic shape over which an armature and concrete is applied.

POLYSTYRENE BEADS

Lightweight foam beads that can be used as a lightweight aggregate to lighten a concrete mix.

POZZOLANS

Silicates (powders such as fly ash, or kaolin) that are sometimes added to cement to improve its properties. The silicates combine with the calcium hydroxide in the cement paste to produce insoluble *cementitious* substances. Pozzolana was a volcanic ash found near Pozzuoli and used in Roman times to make cement by mixing it with lime.

PVA

Or polyvinyl alcohol fibres are a recently developed fibre additive in ECCs. These plastic fibres make a molecular bond with concrete (unlike polyester or nylon fibres), adding tensile strength.

R

REBAR

Steel reinforcing rod used in concrete.

REINFORCED CONCRETE

Concrete that has been strengthened by embedding a reinforcing material in it, usually steel.

RETARDER (RETARDANT)

An admixture that extends the setting time of concrete.

S

SET

A term used to describe when concrete becomes hard or rigid.

SHRINKAGE CRACKS

Cracks due to shrinkage or temperature as the volume of concrete contracts usually within the first few days of placement.

SILICA FUME

A silicate, a by-product of producing silicon metal or ferrosilicon alloys. It is a very fine dark grey powder. One of several *pozzolans* that can be added to concrete.

STUCCO

A type of mortar that is applied to the outside of buildings to give a hard finish.

V

VERMICULITE

A naturally occurring soft mineral that resembles mica; when heated it produces a lightweight, sterile, laminated structure. Used for plant soils, as an insulating material, and to make lightweight concrete.

W

WORKABILITY

The ease with which concrete can be mixed, put in place and finished without separation.



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