CEMENT ADMIXTURES ASSOCIATION

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the Sign of Quality

ADMIXTURE INFORMATION SHEET AIS 8

ADMIXTURE TYPES

Admixtures are normally provided as water based solutions and can be added to the concrete at up to 5% on cement weight, although most types are added at less than 1.6% and many are at less than 0.8%. Most admixtures conform to the requirements of European Standard EN 934. Detailed information on admixture types is available on the CAA ATS sheets
Admixtures are an essential ingredient in quality concrete, improving the environmental performance, increasing durability and often providing the route to advanced construction design and methods.
The main admixture types can be summarised as follows:

Normal Water Reducing / Plasticising admixtures

Often lignosulphonate based, they are used to increase workability at constant water content and / or reduce water by up to 10%. Used by most readymix companies to optimise concrete performance for normal concrete.

High Range Water Reducing / Superplasticising

Based on sulphonated Naphthalene or Melamine formaldehyde condensates, Vinyl polymers or Polycarboxylate Ethers.
These admixtures give a much higher performance than the normal plasticisers. They are used to give very high levels of workability or water reductions from 12 to over 30%. They are used extensively on larger projects where reinforcing steel requires high workability. Also used in precast and on site where the large water reduction provides very high early strength.

Retarding

These admixtures slow the rate of cement hydration, preventing the cement from setting before it can be placed and compacted. This type of admixture is mainly used in hot conditions and climates.

Accelerating

Used to speed the rate of early hydration of the cement. Can accelerate the setting and or the early strength development. Used mainly in cold conditions or where very early use of a concrete pavement is required to provide access.

Air-entraining

Based on special surfactants, these admixtures cause tiny air bubbles < 0.3mm in diameter to stabilise within the cement paste. This air helps to prevent the concrete from cracking and scaling as a result of frost action. Air also increases cohesion in the mix, reducing bleed water and segregation of the aggregate before the concrete can set.

Water Resisting (waterproofing)

These water repellent admixtures block or impede the flow of water through the natural capillaries in hardened concrete. Used in structures below the water table or in water retaining structures.

Ready-to-use mortar admixtures

They increase the cohesion and retard the setting of mortar for masonry, allowing it to be delivered to a building site by readymix in large volumes that can still be used within its working life.

Sprayed concrete admixtures

Provide a very rapid set to concrete that is sprayed onto vertical and overhead applications, preventing it from falling off before it has time to set. Mainly used in tunnelling applications for early roof support. Dosage may exceed 5%

Corrosion Inhibiting

These admixtures work for many years after the concrete has set, increasing the corrosion resistance of reinforcing steel to reduce the risk of rusting steel causing the concrete to crack and scale.

Foamed Concrete / CLSM

Powerful surfactants that allow very large amounts of air to be formed in the concrete, producing a low strength, light weight material, particularly suitable for filling large voids.

Polymer Dispersion admixtures

Polymer emulsions that film form within the concrete or mortar to give enhanced bond and flexibility to the mix. Mainly used in thin floors or for repair situations. Addition is often more than 5%.

Pumping Aids

Used to reduce pump pressure in long pump lines or where difficult aggregates are being used. Especially effective with lightweight aggregates.

Self-compacting concrete

This very high fluidity concrete uses special mix designes and superplasticisers. It may also require a Segregation Control or Viscosity Modifying admixture (VMA).

Precast, semi-dry concrete

Semi-dry or Earth-dry concrete used to make pavers or blocks requires special admixtures to aid full compaction without effecting the properties required for immediate demoulding.

Shrinkage reducing admixtures (SRA)

Concrete shrinks, mainly due to loss of excess water. This causes internal stresses that lead to cracking or curling, especially in slabs. These admixtures reduce the shrinkage stress.

Truck Washwater admixtures

These environmentally friendly admixtures allow the re use of water and washings used to clean out readymix trucks at the end of a day. The washings are treated with the admixture and then combined back into the following days concrete without any detrimental effects to the concrete quality.

Anti-washout / Underwater admixtures

Concrete that is placed under water may be subject to washout during placing and before it hardens. These admixtures stabilise the mix, increasing cohesion and reducing the washout.

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