

The industry poised for supersize growth

Construction chemicals can save time and cost while ensuring superior quality of the end product

The growth of the construction industry in India has been phenomenal. India is ranked number one among the top ten spending nations on the construction sector in the world with the sector being currently assessed at Rs 4000 billion.

Production of cement is more than about 250 million tons in India. A report on 'Global Construction 2025', estimates that China, India and the United States will account for almost 60 per cent of global growth of the construction sector. The Government of India is spending 9 per cent of the GDP on various infrastructure projects.

With construction industry poised for phenomenal growth, the construction chemicals market is also experiencing substantial growth. In the Indian construction market, which is dominated by demand for the best quality at low cost, construction chemicals play a vital role.

Solutions for engineers

Construction chemicals provide viable solutions to the civil engineers in order to build strong and durable structure while minimising the workmanship involved. Construction chemicals are important in the construction process as they lead to mass concreting and faster construction. These construction chemicals also increase the life of the structures and can protect them from various environmental calamities.

The construction chemicals mainly consist of chemical formulations added in specific quantities during construction in cement or concrete or other construction material to meet the functional, aesthetic, and design requirement of civil structures.

The ordinary concrete requires further modifications to meet the expectations and deliver strong and sustainable structure suitable for various climatic and critical conditions. This is achieved through the addition of chemicals. Construction chemicals include asphalt additives, concrete admixtures, protective coatings, adhesives and sealants.

Superior quality of end product

Construction chemicals can save time and cost while ensuring superior quality of the end product. Few of the benefits of using construction chemicals in construction are:

- Durability
- Strength
- Chemical resistance
- Colour
- Reduction in water and cement requirement
- Enhanced working properties of construction materials
- Resistance to withstand adverse climatic and working conditions



as per design specifications/ requirements

- Protection from natural factors like fire/heat
- Providing pleasant appearance without compromising over quality of the structure

Types of construction chemicals

The construction chemicals can be generally divided into the following groups:

*Concrete Admixtures: Admixtures are ingredients other than water, aggregates, hydraulic cement and fibres that are added to the concrete batch immediately before or during mixing, in nominal quantities.

A proper use of admixtures offers certain beneficial effects to concrete, including improved quality, acceleration or retardation of setting time, enhanced frost and sulphate resistance, control of strength development, improved workability and enhanced finishability.

*Waterproofing Chemicals: Waterproof or water-resistant describes objects relatively unaffected by water or resisting the ingress of water under specified conditions. Such items may be used in wet environments or under water to specified depths.

Water proofing compounds are available in liquid, solid, slurry and two-component coating forms. These products could be urethane based, modified asphalts, clay based or rubber polymers. Water proofing compounds are designed to stop water infiltration. These compounds or membranes can be extremely effective when applied to the exterior of a foundation system.

*Flooring Compounds: Flooring compounds are mostly epoxy and polyurethane based. Industrial flooring compounds are used to meet various industrial needs such as abrasion, load impact, chemical attack, moisture penetration, strengthening of damaged floors, as well as improving the aesthetic appeal of the floor. They are also used to provide certain special features such as slip resistance, static resistance, fire resistance, antibacterial properties, and so on.

*Repair and Rehabilitation: The repair and rehabilitation is a highly unexplored and underdeveloped market. Retrofitting is basically the addition of new technology or features to older systems and improving the structures with energy efficiency.

Rehabilitation is reconstruction of the structural components which were damaged. These products include cementitious repair mortars, concrete floor repairing systems, polyester and epoxy-based resin mortars, moisture



insensitive epoxies, structural additives, synthetic adhesives, rust removers and corrosion inhibitors. The main rehabilitation methods are concrete jacketing, steel jacketing and FRP Wrapping.

Miscellaneous

Sealants-Sealants are used to seal expansion joints, cracks, joints in concrete roads and to fill gaps between concrete. There are four types of sealants.

*Polysulphide sealants: These are most commonly used in the construction industry as expansion joints for concrete roads, structural joints and others.

*Polyurethane sealants: These are used for high-end applications where high flexibility and bonding strength are required.

*Silicone sealants: These are generally used where good bonding is required between two dissimilar surfaces such as fixing of glass on metal frame.

*Acrylic sealants: These are generally used for crack or gap filling and application in windows and door gap sealing, etc.

Grouts

Grouts are compounds used for giving extra strength to the foundations of load bearing structures. They are also used for repair and sealing of cracks and gaps. Grout is a construction material used to embed rebars in masonry walls, connect sections of pre-cast concrete, fill voids, and seal joints (like those between tiles).

Grout is generally a mixture of water, cement, sand, often colour tint, and sometimes fine gravel (if it is being used to fill the cores of concrete blocks). It is applied as a thick emulsion and hardens over time, much like its close relative, mortar. Unlike other structural pastes such as plaster or joint compound, grout,

when mixed and applied correctly, creates a waterproof seal.

For strong, long-lasting structures

Construction chemicals are essential in order to build strong and long-lasting structures. It plays a role similar to that of a doctor, by providing solutions to civil engineers to build healthy and long lasting structures which can last for years without any risk and fear.

The Indian construction chemicals industry was valued at INR 3,500 crore in FY 14 and grew 12 per cent between FY 09 to FY 14. The industry is expected to grow by 15 per cent per annum over the next 5 years to reach INR 7,000 crore by FY19.

The government's plan of investing \$1 trillion on infrastructure during the 12th Five-Year Plan and 'Make in India' initiative would have a positive impact on the demand of construction chemicals. The industry is growing and innovation becomes essential in order to find out new ways to build strong structures and cutting down on time and cost. All these developments are leading to a substantial growth in the construction chemical market in India.

(Sources: Construction Chemicals as Enabler for Smart Cities, FICCI)



Arvind Gowda
CEO, Expat Engineering India Ltd (EELL)

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