

Role of Plastics and Polymers



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Plastics and polymers (called plastics for convenience) are ubiquitous. It is the latest family of materials having many unique properties and are therefore used in several new applications, driving innovations and path breaking products and solutions while changing the way we work, live, move, entertain, play or interact. New economy tools and solutions are heavily dependent on plastics starting from computers to iPads.

Plastics in Building Construction and Infrastructure Sector

Plastics are playing an increasingly high role in the field of infrastructure and buildings. Depending on the merits of each material, designers, structural engineers and architects now have a wide array of traditional materials, pre-engineered materials, plastic materials or blend of different materials to choose from. In construction of buildings, polymers stabilise the soil whereas in canals, plastics are indispensable for lining. Transportation sector is now depending heavily on plastics to reduce load and improving energy efficiency. In the energy sector, plastics help in better insulation as well as in creating superior distribution infrastructure.

In a typical built environment, plastics now have a greater role to play. For water and wastewater, plastic materials have natural advantages. In fenestration, uPVC windows are now dominant player from the angle of energy efficiency, acoustic insulation and performance. In other types of fenestration, again plastics have no match when it comes to doors, curtains or ventilators. Plastic formwork systems are driving innovations for speedy and high quality construction for all income groups of society and cladding or paneling materials are helping to improve aesthetic and speed. Members of plastics family like polyurethane and expanded polystyrene are helping in energy conservation and are thus indispensable for creation of green built spaces. Even in respect of roofing, plastic coatings and plastic materials are bringing down energy consumption for a given area.

Strengths of Plastics vis-a-vis Other Materials

In infrastructure, cement and steel are the two basic building blocks. Cement concrete and steel are used for basic structure in dams, bridges, foundations, walls, roofs etc. In many of these applications plastics do not come near them from the angle of technical and commercial considerations. However, there are lots of applications where time, cost, speed, quality, quantity etc. go in favour of plastic materials. Belief in holistic approach has led to tapping the strength of plastics wherever possible and using them for the evolution of suitable products. One is also not shy of combining them with other materials so as to evolve cost effective and appropriate solutions. To illustrate, a plastic based formwork system is used for the construction of concrete houses that are far ahead of traditionally constructed houses. This unique formwork system combining plastics and suitable structural materials like aluminium helps in the rapid construction of high quality houses at affordable prices for serving a large number of economically weaker section of people. Likewise, combining steel structure with sandwich panels consisting of steel and PUF helps in delivering energy efficient, green, cost effective and timely solutions for meeting huge social infrastructural needs in the country.

In short, it is best to use the properties of different materials and combine them in an optimised manner to give people and customers cost effective and superior solutions.

Family of plastics and their blends or configurations are evolving at a rapid pace and include huge varieties of thermoplastics and thermosetting materials. The latter family (thermosetting materials) is integral to several structural products like wind blades, large diameter pipes, underground tanks, panel type tanks etc. which are established the world over as the best alternatives in their respective fields.

Customers are indeed very discreet. Wherever plastics or plastic based composites are technically and commercially superior to traditional materials and solutions, they try them out and adopt them on a massive scale. Every new material or application has to go through a cycle of concept, prototype designing, pilot approvals and lastly a massive acceptance. As specifiers and designers learn more about plastics, experiment with them and satisfy themselves with the offered product and features, use of these wonder materials is sure to go up to a higher rate than other materials. In the recent years, cumulatively plastics are growing at 14-15% as against the GDP growth of 9%. With optimum blend of cost and performance, plastics will continue the march at a similar pace in the years to come.

Outlook

Use of plastics in building and infrastructure will continue unabated. Most of the plastic processes are automated and energy efficient. Products or solutions made with plastics will be in sync with the 'goal of green and clean world' that is healthy and friendly to live in.