

Eliminating the Need for Portland Cement in Concrete

Although polymer concrete only became well known in the 1970s, it was first introduced in the late 50s. Thanks to its development through the years, the polymerized monomer is now able to replace Portland cement as a binder in concrete. Polymer concrete presents many superior properties to traditional concrete utilizing Portland cement, including **high compressive and impact strength**, fast curing, low permeability, and resistance to chemicals and corrosive agents. Thanks to these properties, it has found applications in very specialized domains around the world.

What is Polymer Concrete?

Polymer concrete is a composite material fabricated from the polymerization of a monomer/aggregate mixture. It is a compound that uses synthetic organic polymer as binder and is prepared by mixing polymeric resin with aggregate mixture. Polymer concrete is generally produced by reducing the volume of voids in aggregates, which lowers the quantity of polymer required for binding the aggregates in question. The polymeric resins that are commonly used to produce this type of concrete are methacrylate, epoxy resin, furan resins, polyester resin, and vinylester resin. Due to their lower cost, good mechanical properties, and easy availability, unsaturated polyester resins are the most commonly used. The choice of which resin to use highly depends on the application and factors like chemical and weather resistance, desired properties, and cost.

How is it used?

From nuclear power plants, marine works, industrial tanks, and linear drainage systems, polymer concrete is being used in a number of various applications including water storage systems and electrolysis of non-ferrous metals. Over the years, growth in transportation and infrastructural activities have been a main contributor to the increase in demand for polymer concrete.

Due to the superior characteristics mentioned above and a world-wide increase in the need for a tougher, stronger, more durable and ductable building material, polymer concrete is growing in popularity. Not to mention the advantages of using polymer concrete for its environmental benefits. One thing restraining the widespread use of polymer concrete is its high cost, which restricts its use to applications that require low energy consumption and less manpower.

Where is it being used?

While Asia Pacific is leading the polymer concrete market across the globe, the rapid expansion of the construction industry in the United-States means that the U.S. also accounts for a significant share of the polymer concrete market as well. The polymer concrete market in other places around the world such as Europe, the Middle East, and Africa are expanding at a much slower pace.

As time goes on, the use of polymer concrete around the world is expected to grow. The need to replace existing concrete as it ages, an increase in awareness about the usage of polymers in concrete, as well as the development of newer and less-expensive products will help bring the polymer concrete market to a larger scale.

Sources:

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