ABSTRACT

Concrete being the most popularly used building material, many efforts were made to improve the qualities of concrete. Concrete being extremely weak in tension, its tensile capacity can be increased either by introducing steel rods in the tension zone or by uniformly distributing the fibres (metallic or mineral or natural) in the concrete mass.

Reinforcing brittle matrices to improve their mechanical properties is an age-old concept. However, the modern development of fiber reinforced cement composites dates back only to the 1960s. In the beginning, only straight steel fibers were used. The acceptance of fiber reinforced concrete by the construction industry has led to a number of developments. Among these developments are new fiber types made of steel, stainless steel, polymeric and mineral materials, and naturally occurring materials. New manufacturing techniques and applications have also been developed. A large number of researchers around the world have investigated the various aspects of fiber-reinforced composites (FRC).

The introduction of fibres into the concrete induces many desirable properties. Additions of fibres increase the ductility of concrete and substantially improve the tensile strength, cracking resistance, impact strength, wear, and tear and fatigue resistance.

Many types of fibres like steel, carbon, GI, glass, asbestos, nylon, polypropylene, polyester, jute, coir fibres etc...can be used for the production of fibre reinforced concrete. Even the plastic fibres can be used in the production of fibre reinforced concrete.

In India, the plastic industry is growing phenomenally. Plastics have been used in all sectors of the economy-infrastructure, construction, agriculture, consumer goods, telecommunications and packaging. Polymer demand in India has consistently recorded double-digit growth rates, tripling every 10 years. However, as compared to the world statistics of per capital consumption of plastics, it is still far less.

The disposal of waste plastics after their use is causing a threat to the environment. Plastic is a non-biodegradable/non-perishable material, and it neither decays nor degenerates in water or in soil.
On the other hand it pollutes the water and soil. Plastic if burnt releases many toxic gases and cause the air pollution; the inhalation of such toxic gases is very dangerous to health. Suitable/safe methods of plastic destruction are not yet invented. Because of this nature, many countries of the world have put a ban on using the plastics. The plastic is becoming a real headache for the environmentalists.

Such plastics, after their use, when they become waste, can used in the form of fibres in concrete to impart some additional desirable qualities to concrete. The waste plastic containers/utensils etc...can be cut in the form of fibres and they can be used in concrete to increase the tensile strength and other properties of concrete. The waste plastic fibre reinforced concrete will have certainly good qualities when compared to ordinary concrete. Some special properties may be induced to concrete by the addition of waste plastics fibres and it can be utilized effectively in the construction field.

The main objective of this experimental investigation is to throw some light on the effective use of waste plastics in concrete. The effect of addition of waste plastics in the form of fibres into the concrete has been studied in this experimental investigation.

To understand the behavior of waste plastic fibre reinforced concrete (WPFRC) thoroughly, the following experiments are being conducted

1. Effect of Different Aspect Ratios of Waste Plastic Fibres on the Properties of Fibre Reinforced Concrete
2. Effect of Fly Ash on the Properties of Waste Plastic Fibre Reinforced Concrete
3. Effect of Micro Silica on the Properties of Waste Plastic Fibre Reinforced Concrete
4. Effect of Redmud on the Properties of Waste Plastic Fibre Reinforced Concrete
5. Effect of Replacement of Natural Sand by Stone Crusher Dust on the Properties of Waste Plastic Fibre Reinforced Concrete
6. Effect of Recycled Aggregates on the Properties of Waste Plastic Fibre Reinforced Concrete
7. Effect of Addition of Polymer on the Properties of Waste Plastic Fibre Reinforced Concrete
8. Effect of Different Curing Method on the Properties of Waste Plastic Fibre Reinforced Concrete
10. Bond Characteristics of Waste Plastic Fibre Reinforced Concrete

