

# Evaluation of Strength of Fibre Reinforced Concrete Using Plastic Fibres

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**Abstract—** Now-a-days, environmental problem is faced all over the world. The things which are invented and used for our luxurious life are responsible for environmental pollution. Due to improper waste management, we facing land pollution. Land pollution is mainly due to waste plastic. This plastic can be reused or recycled to maintain the beauty of nature. To address this issue, in this paper, the waste plastic is used to make fibres. These plastic fibres were added in various percentages in the M25 grade concrete. This paper describes the performance of plastic fiber reinforced concrete (M25). The experiments were carried out on the specimens like cubes and cylinders which were casted in the laboratory and their behavior under the test was observed. The plastic fibers were added from 0.0 % to 0.8 %. The compressive strengths of concrete were determined after 7, 14 28 and 56 days of curing period. The test results were compared and the relationships between the standard concrete and Fibre reinforced concrete are presented.

**Keywords** ---Cement Concrete Composites, Plastic Fibres, Fibre Reinforced Concrete, And Compressive Strength.

## I. INTRODUCTION

The most widely used construction material is concrete. The performance of concrete after construction depends on its ingredients. It is well known that plain concrete is brittle but strong in compression. But at the same time, it is weak in tension. The fiber reinforcement concrete transform a brittle concrete into a pseudo ductile material and very advantageous to concrete. Fibres addition in concrete can arrest micro cracks causing gradual failure. The fibers made from cheap or waste materials like plastic, glass etc., may be used for manufacture a wide range of structural units with cement mortar composites and has a great potential for developing countries like India. Mechanical properties of concrete has been studied by many researchers to enhance the properties of concrete using different fibers like glass, steel, carbon,

synthetic organic and natural fibers. The present paper studies the effect of addition of various percentage of plastic fibers on mechanical property and behavior of concrete. Effect of plastic fibers in concrete under compression strength are discussed.

The fibre-reinforced polymer (FRP) composite is a combination of :

- A polymer (plastic) matrix (either a thermoplastic or thermoset resin such as polyester, vinyl ester, epoxy).
- A reinforcing agent such as glass, carbon, aramid or other reinforcing material.

The resin is used to coheres and gives shape to the element while fibres reinforce it. Tis combination results in light weight and strong composite material. The FRP composites have high strength to weight ratio which provides discernible reinforcing function.

## II. MATERIALS

Two types of materials are used in FRP:

- A polymer (plastic) matrix and
- Fibre.

### A. Resins Used In Frp

Some of the most important material characteristics to consider in selecting a matrix for structural FRP are: stiffness, strength, thermal and electrical conductivity, ability to impregnate and bond to fibres.