



**ORIGINAL RESEARCH PAPER**

**Engineering**

**UTILIZATION OF FLY ASH IN FIBRE REINFORCED CONCRETE**

**KEY WORDS:** Polypropylene fibre, Cementitious material, fly ash, mechanical properties of concrete.

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**ABSTRACT**

Concrete is most widely used man made construction material. Different types of experiments done on concrete every day to improve the properties of concrete. To modify the properties of the concrete different types of cementitious material are used with admixtures. Main advantage of using cementitious material is to lower down the consumption of cement and also it modifies the mechanical properties of concrete. Among all cementitious material Fly ash give best performance in strength, durability and workability aspect of concrete. Use of fiber along with cementitious material in concrete is not new but there is considerably change in types of fibers which are used in concrete. The main advantage to use fibers with cementitious material is that properly distribution fibers in concrete. In this paper combination of different types of polypropylene fibers with fly ash are studied on strength aspect of concrete.

**1. CONCLUSIONS**

- From the various researches we concluded that both Fly Ash and Polypropylene Fiber have significant effect on mechanical properties of concrete.
- Addition of Fly Ash decreases the workability of the concrete. To improve the workability of concrete containing Fly Ash use of super plasticizer is necessary.
- Addition of Fly Ash in concrete improves the mechanical properties of the concrete.
- Main advantage of Fly Ash is fineness of itself. Because its fineness can fit into space between cement grains in the same way that sand fills the space between
- particles of coarse aggregates and cement grains fill the space between sand grains. As for chemical reaction of silica fume, because of high surface area and high content of amorphous silica in fly ash, this highly active pozzolan reacts more quickly than ordinary pozzolans.
- Main purpose of using fibers in concrete is to eliminate or lower down the shrinkage cracks developed. It cannot be used as reinforcement but it can lower down the requirement of reinforcement.
- Addition of Steel fibers in concrete containing Fly Ash also improves the properties of concrete. Due to addition of Fly Ash in concrete there is well dispersion of fibers in concrete which directly affects the mechanical properties of the concrete.
- Variety of Polypropylene fibers is available in the market based on material and aspect ratio of fiber. Strength of concrete containing the fibers is depending on aspect ratio and volume of fibers in concrete.
- Higher the aspect ratio of the fiber there is good bond between the fiber and concrete which directly affects the mechanical properties of concrete and give good results. But problem associate with it is to difficult handle them because of problem of balling in concrete. Thus it cannot use in larger percentage.
- Smaller the aspect ratio of the fiber which also called micro fibers there is not proper bonding between the fiber and concrete which not give good results compare to higher aspect ratio but not worst one. But using of this fiber in concrete is quite easy compare to higher aspect ratio because of there is no problem of balling. It can also use in higher percentage. Problem of developing micro cracks in concrete are easily lower down due to small size of its which directly enhance the performance in durability and also improve the flexural and tensile properties of concrete. It decreases the compressive strength slightly.
- Lots of work is done higher aspect ratio of fiber but there is also need to study on behaviour of micro fibers in concrete both on strength and durability aspect because of its advantageous in many ways.

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