

# A STUDY OF POLYPROPYLENE FIBER REINFORCED CONCRETE”- A REVIEW

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## Abstract:

The reinforced polymer in civil engineering increase rapidly, the various experimental investigation for determination of properties of polypropylene fibre are discussed in paper work. this paper present the effect of polypropylene (PP) fibre on various properties of concrete such as compressive strength, tensile strength, workability and fractured properties with various content of fibre range of (0%, 0.5%, 1%, 1.5%) investigation was carried out to various type of effect such as compressive, spilt tensile, flexural shear strain, plastic shrinkage cracking by the curing period 7 & 28 days and that the addition in polypropylene fiber to concrete exhibit better performance. Furthermore, shrinkage cracking is reduced by 83 to 85% by addition of fibres in the range of 0.35 to 0.50%. Polypropylene fibre are hydrophobic, that is they do not absorb water. However, further investigation were highly recommended and should be carried out to understand more mechanical properties of fibre reinforced concrete.

**Keywords--** Concrete, polypropylene fiber, different curing conditions shrinkage cracking.

## I. INTRODUCTION

### CONCRETE:

The fibre reinforced concrete is the increasing its structural efficiency, when fibre is the mix in concrete by a small ratio volume to making the fibre reinforced concrete. The monofilament polypropylene fibre is used in reinforced concrete. Polypropylene fibre is hydrophobic fibre that's why they don't absorb water. The fibre to provision of shrinkage, spalling, micro cracks of structural element of construction industry. The main advantage of the polypropylene fibre efficient melting point (165”) & consisting low cost. The apply of the fibre in reinforced concrete by the construction grow at large amount, because admix of fibre in reinforced concrete then improvement of tensile strength, flexural strength and causes of cracks and spalling. To provide the polypropylene fibre in reinforced concrete is economically effective cost of large project construction therefore, the used in the ratio of polypropylene fibre as

0%, 0.5%, 1%, 1.5% admix in reinforced concrete. Secure components second hand would have residual linking structures, great workable asset and good current compatibility. Reinforcement need that there will be uneven conduction of weight from the concrete to the edge among concrete and reinforced constituents. Thus the concrete and the constituents reinforced shall the same strain. A decent concrete necessity have high weakness and low absorptivity.

### POLYPROPYLENE FIBER:

Conventional concrete has inadequate ductility, little influence and scrape conflict and little confrontation to exceedingly. A decent concrete necessity embrace extraordinary control and little penetrability. Adding of polypropylene fibre strengthening the ductile strength. Adding of the fibres

progress the topmost ductility performance, pre-crack workable quality, durability, effect aggressive, flexural strength, collapse performance etc. Although some quantity are available to reduction enduring of toughen in concrete, such as shown in fig. (a).



**Fig. (a): Polypropylene fiber**

As surviving inhibitive admixture and covering, a improved and everlasting solution may be exchange the steel with reinforced that is a smaller amount ecologically delicate. More freshly micro fibre, such as those used in out-dated compound resources have been introduced into the concrete mixture to growth its toughness, or capacity to fight fissure growing, the fibres used were fine polypropylene monofilaments. Polypropylene fibre is a synthetic fibre by low-slung compactness fine thickness & small modulus of elasticity the exceptional arrivals polypropylene fibre has surprizing strength ductility flexibility small price & easily physical & organic formation.

#### **LITERATURE REVIEW:**

Analysis of work complete by many investigates deliberates the instrument of fibre-matrix interface,

wherevers numerous presentations remain used to calculate the attachment amongst the fibres and cement conditions. As the attachment of fibre and the background productions a main part in the compound performance. Also, this episode also present a review of literature applicable to the exploration and trials completed for fibre reinforced concrete in universal with a eminence of civil engineering applications, fibre reinforced concrete was effectively used in variation of engineering presentation, as of its reasonable and outstanding routine in the production and building field. However, most of the engineers and examines have supposed that by what method and why the fibres achieve so magnificently.

**Amit Rai, Dr. Y. P. Joshi** (2014). They study different types of fibres and their application. The development in concrete properties by polypropylene fibres, they analysed that compressive strength which is increased about 16%. The flexural strength of polypropylene fibres is better quality about 30%.

**Kolli, Ramujee** (2013) polypropylene fibres are favoured for the fibre reinforced concrete. In this study, the outcomes of the Strength properties of Polypropylene fibre reinforced concrete have been deliberate. The compressive strength, excruciating tensile strength of concrete models made with different fibres amounts of percentage varies from 0%, 0.5%, 1% 1.5% and 2.0% were studied. The models with added Polypropylene fibres of 1.5 % obtainable enhanced results in comparison with the other fibre percentage.

**S. Panda, N. H. S. Ray** (2014) recognised an experiment on design process and operations of polymer fibre reinforced concrete. PPFRC is appropriate substantial

which may be used for cement concrete and it consist the extra strength in flexural fatigue and impact etc. There are two constituent of PFRC. one is the existing mix and other is polymer fibres .The polymer fibres rises the compressive strong point 12 to 16% and also the flexural strength 7 to 14% over the regular concrete.

**J.A. Larbi and R.B. Polder** Effects of Polypropylene fibres in concrete:- Microstructure after fire testing and chloride migration revealed that the amount of explosive spalling and the extent of cracking can considerably be reduced by use of suitable amount of polypropylene fibres.

#### **CONCLUSION:-**

1. In this study In optimum result comparison with polypropylene fiber contain 0%, 0.5%, 1%, 1.5% of sample
2. The polypropylene fiber (PPF) reduced initial age disappearance and moisture loss of the concrete mixture uniform when insignificant capacity of polypropylene are used.
3. It is the determine that the growth n percentage of volume of Polypropylene fiber added into the concrete would be decrease workability.
4. In this study of polypropylene reinforce concrete be a decent admixed to meet the present demand of construction to using the reinforcement concrete.
5. In addition to reinforced fiber concrete with compare of predictable concrete the useful to PPFRC concrete in construction industry.

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