

# REVIEW ON RETROFITTING BY USING FIBRE REINFORCED POLYMER

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**Abstract:** The Various reinforced Concrete structures deteriorates due to various reasons such as natural disasters like earthquake and floods etc. Due to various factors such as corrosion, failure or degradation of concrete structures there is need of retrofitting. Retrofitting is the modification of existing concrete structures to improve its strength and durability. In retrofitting Fibre Reinforced Polymer application is a new and advanced technique. Application of FRP sheets for Retrofitting is an attractive alternative. It is an economical solution for increasing strength and durability. Seismic retrofit by using FRP is largely accepted in civil engineering field.

**Key words :** Retrofitting, History of FRP, Components of composite materials, Types of FRP, Retrofitting of RC column and conclusion.

## Introduction :

Structures deteriorates due to various reasons associated with reinforced concrete. Due to natural disasters such as floods and earthquake the existing structures undergoes degradation or sometimes it may cause failure. Due to which the strength may be reduced. In such case there is need of retrofitting and rehabilitation of structures. Retrofitting by using FRP polymers is an advanced and innovative technique for Reinforced concrete structures. Seismic retrofitting is the modified technique to make the structure more resistant to seismic forces. The main purpose of retrofitting is to increase the resistance of damaged building. The application of FRP sheets or strips is an effective strengthening and rehabilitation method. FRP sheets have many advantageous properties such as high strength to weight, corrosion resistance, easy application on structure.

## History of FRP :

Fibre Reinforced Polymer is also called as Fibre Reinforced Plastic. It is a composite material made up of polymer matrix reinforced with fibres. The various fibres such as glass, carbon, aramid, paper, wood and asbestos have been used. The polymer is usually an epoxy, vinyl ester etc. FRP are generally used in aerospace, automotive, marine and in construction industry.

The development of Fibre reinforced polymer for commercial use was being researched in the 1930s. It was first used in an Aviation industry.

## Components of composite Materials :

- **Fibres-**  
Fibre controls the properties of composite materials. There are various types of fibres used such as glass, carbon and aramid. Fibres have stiffness and tensile strength.
- **Matrices-**  
Matrices protect fibres from detrimental effects. The various types of matrices are used such as vinyl ester and epoxy are used on large scale. Epoxy has a good strength, bond and creep property.

## Types of Fibre Reinforced Polymer

### ( FRP):

- **Glass Fibre Reinforced Polymer (GFRP)-**

Glass fibres are made up of silica sand, limestone, folic acid and other ingredients. The mix is heated until it melts. The molten glass is then flow through fine holes in a platinum plate. Then it is cooled and wound. The fibres are drawn to increase directional strength.

- **Carbon Fibre Reinforced Polymer ( CFRP)-**

Carbon fibres have high modulus of elasticity. The carbon fibres do not absorb water and are resistant to many chemical solutions.

## Retrofitting of column by using FRP sheet:

The repairing and strengthening of RC columns through FRP composites includes external wrapping. The columns can be strengthened to increase axial, shear and flexural capacities. FRP sheets can be used to increase the axial load carrying capacity of the column. FRP sheets show less results for square and rectangular columns than to circular columns. Retrofitting by using FRP laminates plays an important role in the strengthening of reinforced concrete columns.

**Conclusion :**

FRP is widely used in a construction industry due to its high strength to weight, resistance to corrosion, and to increase the durability of structure. By comparing the results of the application of FRP the carbon Fibre gives high strength as compared to the glass fibres. FRP sheets increase the load carrying capacities of columns, it shows greater results to circular columns as compared to the square and rectangular columns.