

# Concrete

Lecture - 9

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## Summary

# Fiber Reinforced Concrete



*Fibre reinforced concrete is made with hydraulic cement, and aggregates of various sizes, incorporating discrete, discontinuous fibres.*

The idea of mixing more than one material to obtain a composite is not new. The two phase concept in which two materials are combined to produce a composite has been known since ancient times. The use of straw to strengthen sundried mud bricks and stabilize their dimensional stability, predates the use of portland cement

# Fiber Reinforced Concrete



Mortar and concrete are themselves essentially two phase composite systems in which relatively stiff aggregate particles are embedded in a soft brittle matrix imparting stiffness and stability to the composite.

The idea that concrete can be strengthened by the inclusion of fibers was first put forward by **portar in 1910**, but little progress was made in the development of this material untill **1963** when **Romualdi and Batson** published their classic paper on the subject. Since then there has been a wave of interest in fiber reinforced concree and several intersting experiments have been carried out. Several kind of fibers such as steel, fibrillated polypropylene, nylon, asbesos, coir, jute sisal kenaf glass, carbon have been tried

# Fiber Reinforced Concrete



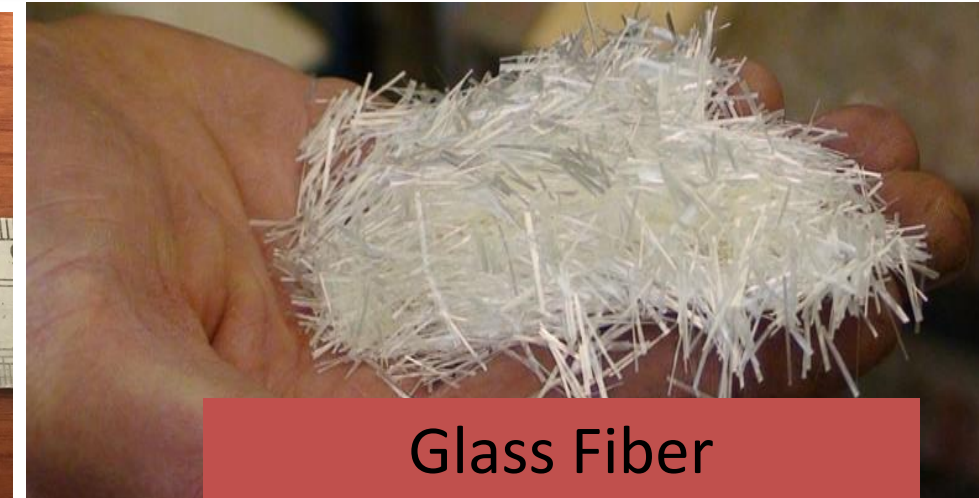
Plastic or Polymeric Fibers

Glass Fibers

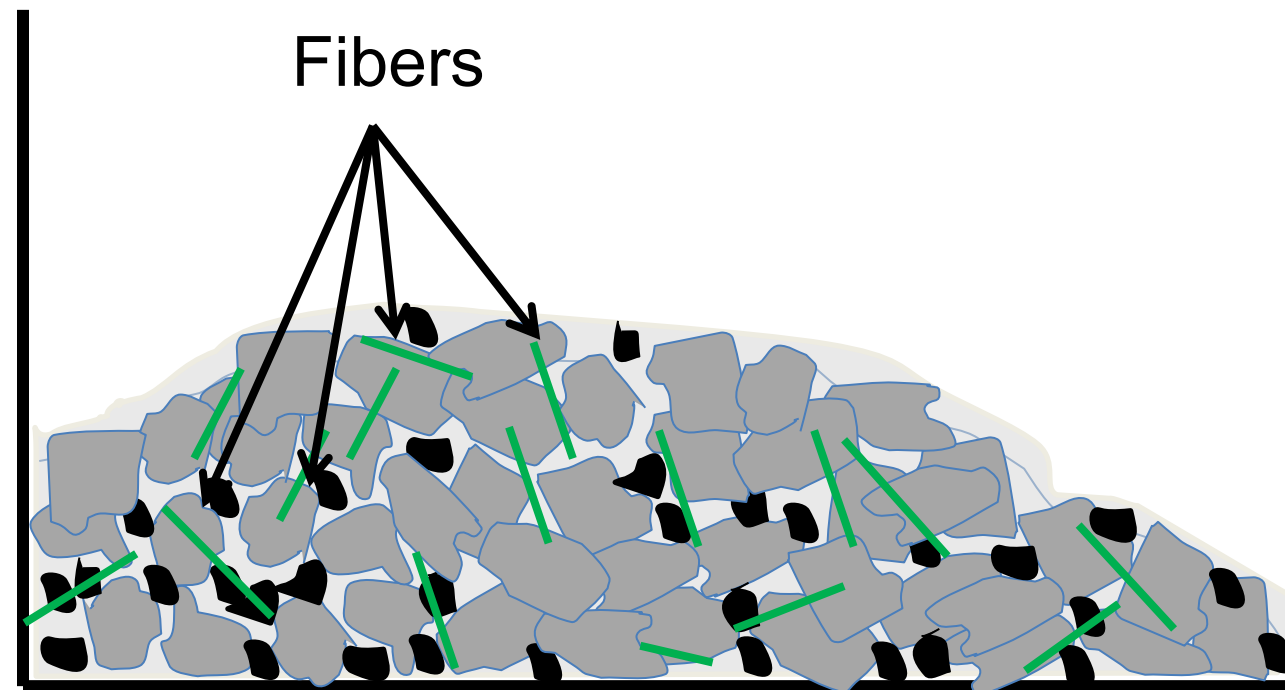
Steel Fibers

Carbon Fibers

Natural Fibers

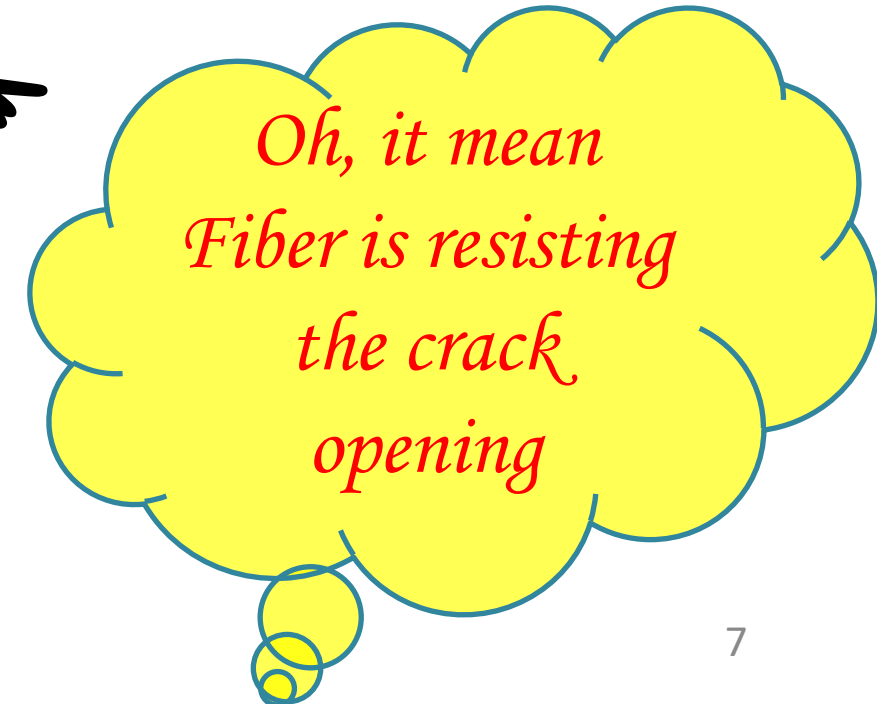
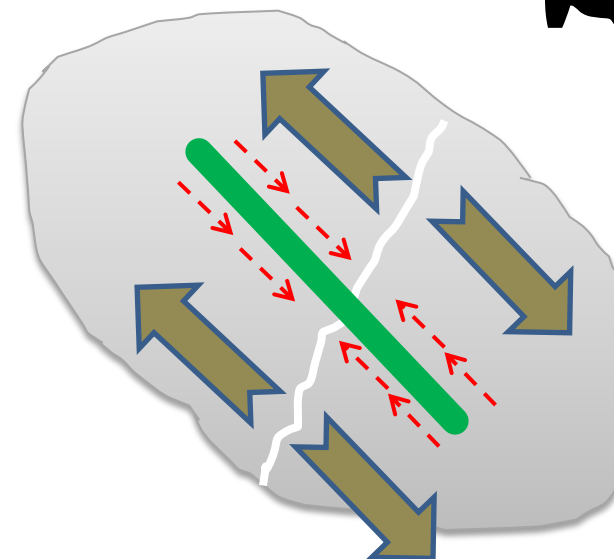
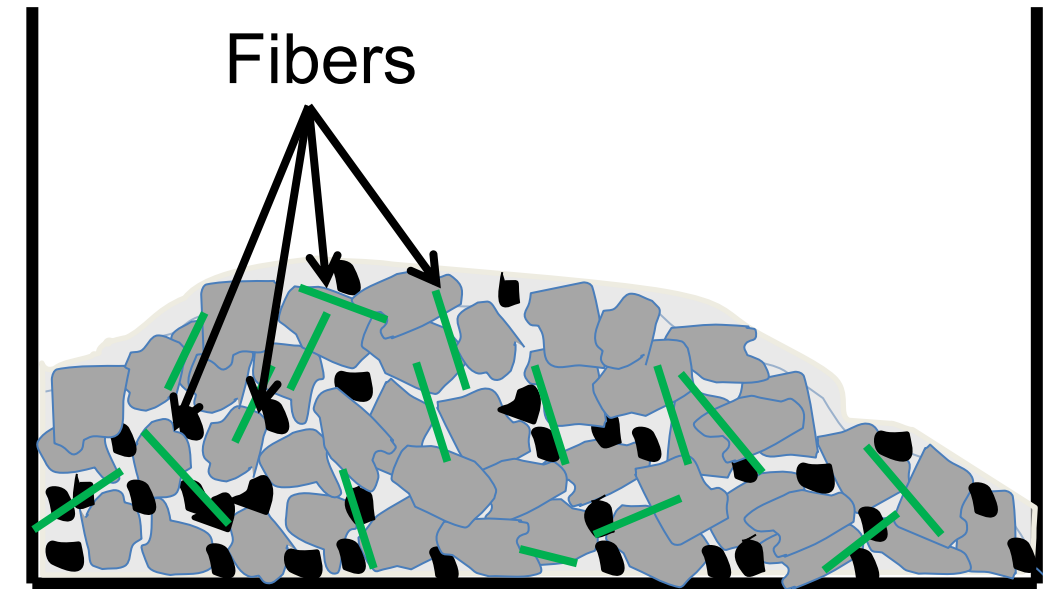
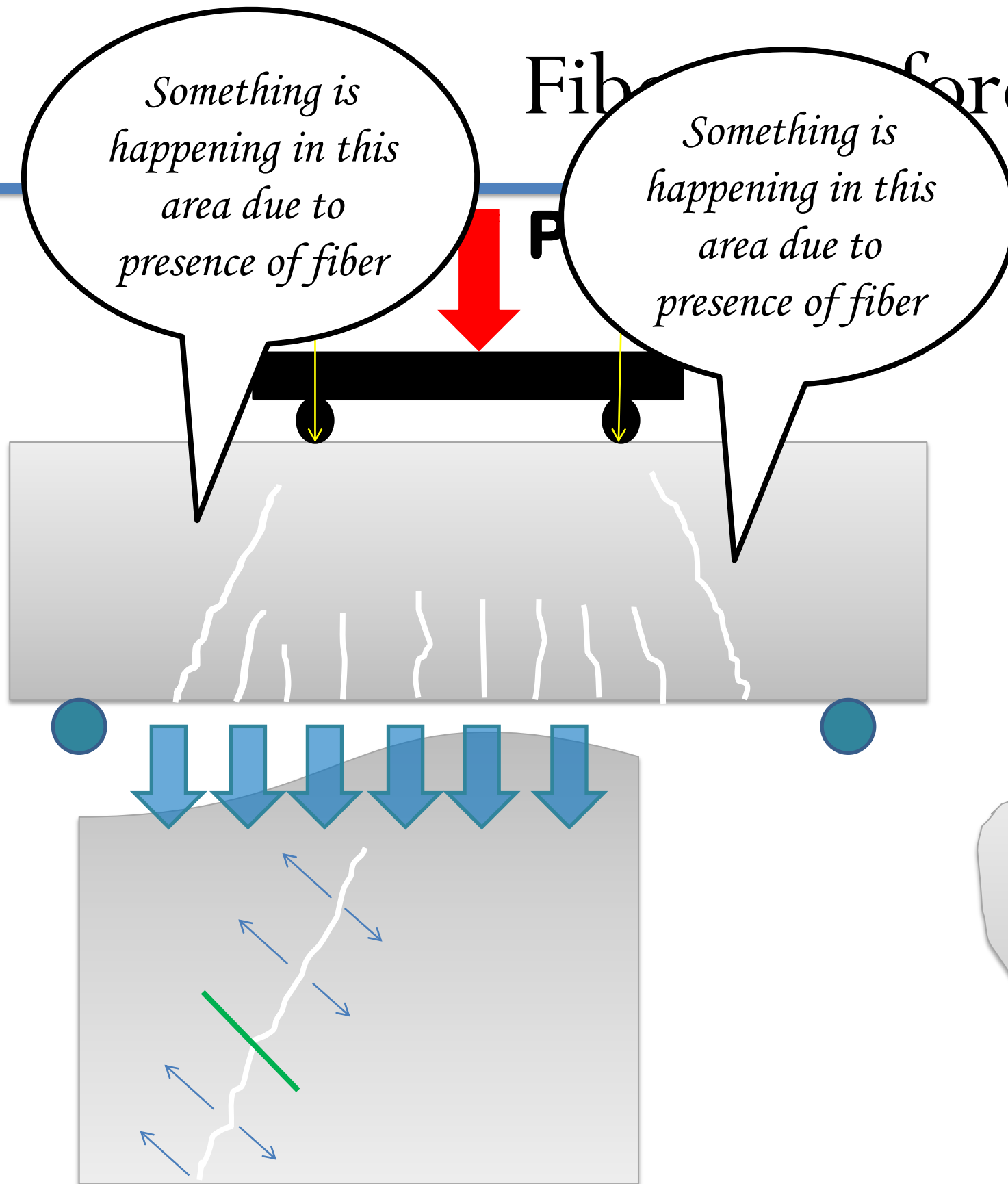


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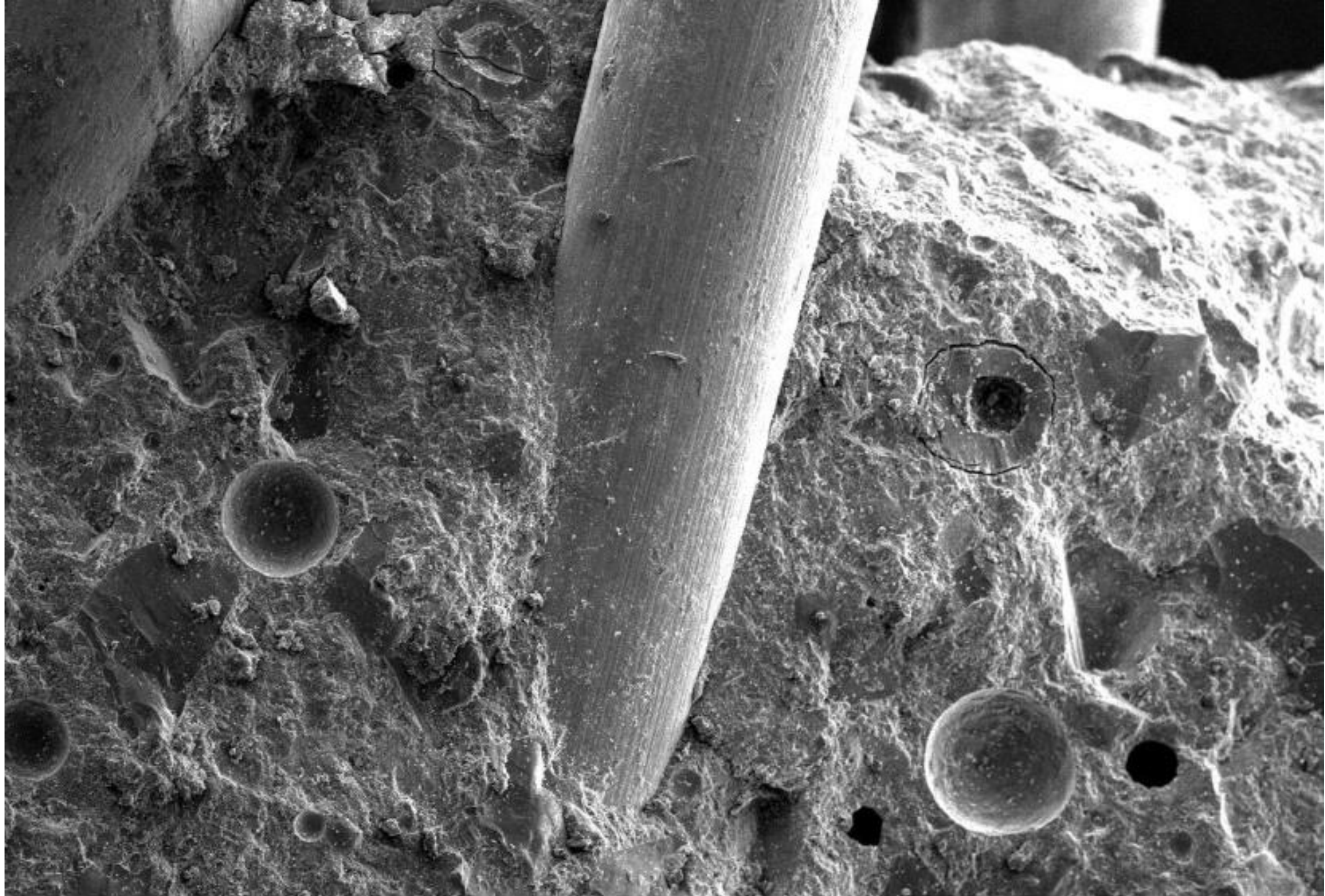


# Fiber Reinforced Concrete



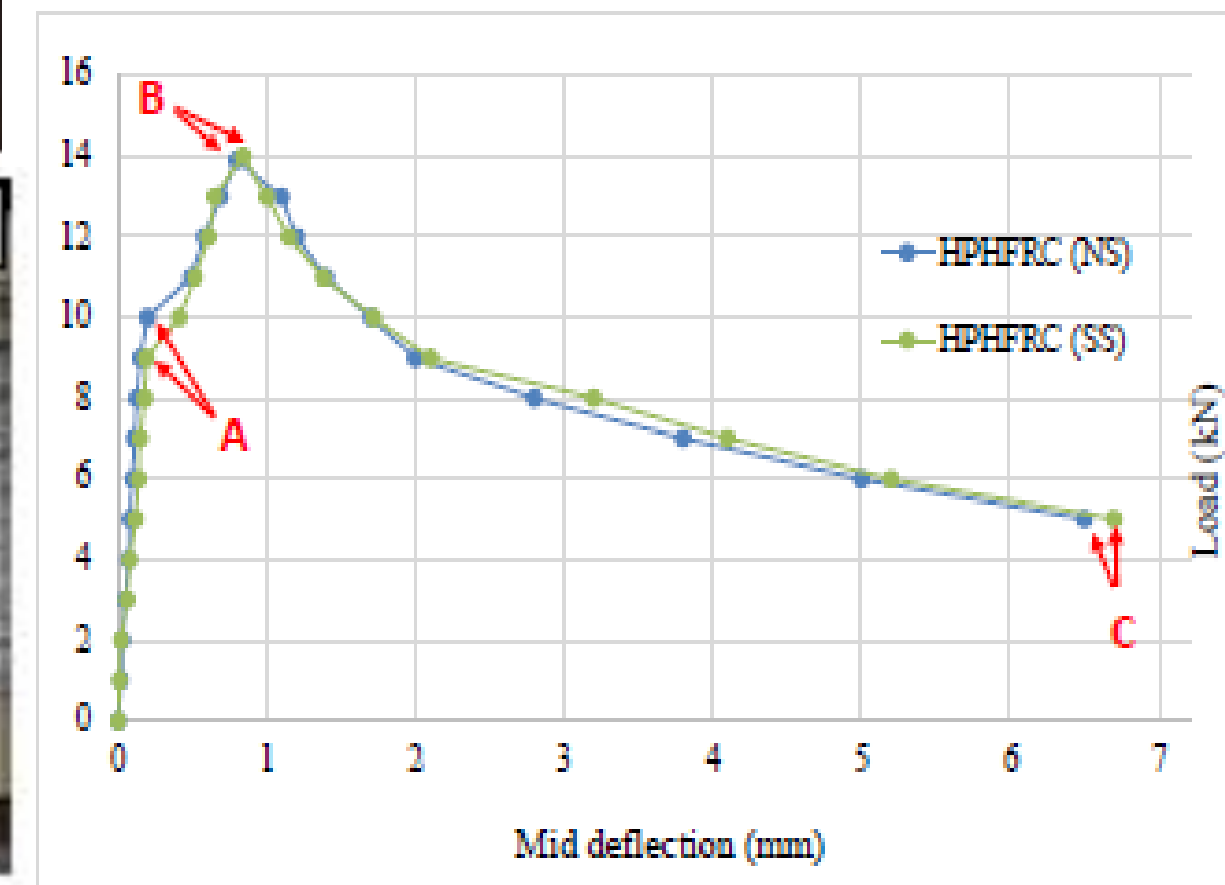


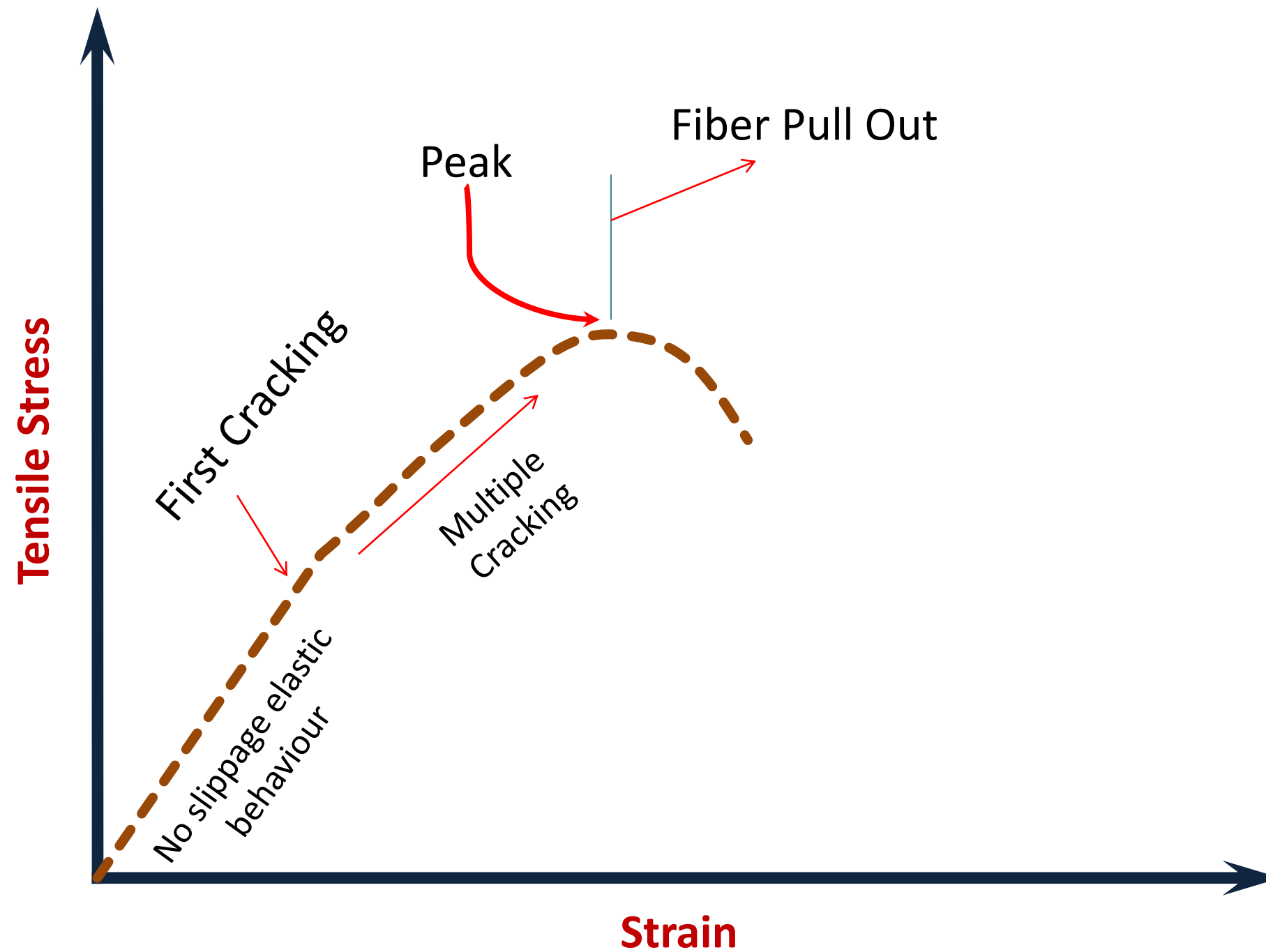




SEI 15kV WD13mm SS35 x50 500µm  
 SAILabs, TIET Patiala G.Mourya 30 Apr 2018







## Fiber Reinforced Concrete

 *Introduction*

 *Types of Fibers*

 *Mechanism of Fiber in Crack Bridging*



**THANK YOU**