

Concrete

Lecture - 9

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Introduction of Fiber Reinforced Concrete

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Types of Fibers

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Mechanism of Fiber Crack Bridging

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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 until **1963** when **Romualdi and Batson** published their classic paper on the subject. Since then there has been a wave of interest in fiber reinforced concrete and several interesting experiments have been carried out. Several kinds of fibers such as steel, fibrillated polypropylene, nylon, asbestos, coir, jute sisal kenaf glass, carbon have been tried

Fiber Reinforced Concrete

Plastic or Polymeric Fibers

Glass Fibers

Steel Fibers

Carbon Fibers

Natural Fibers



Steel Fiber



Glass Fiber

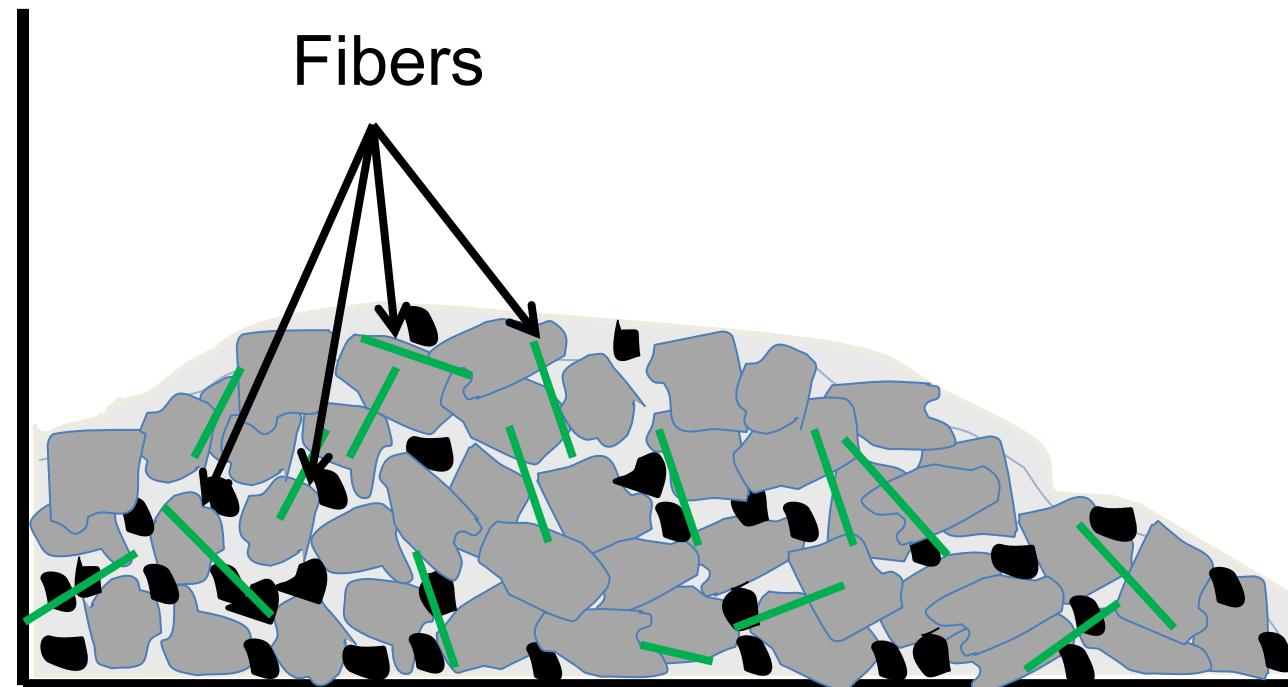


Polypropylene Fiber

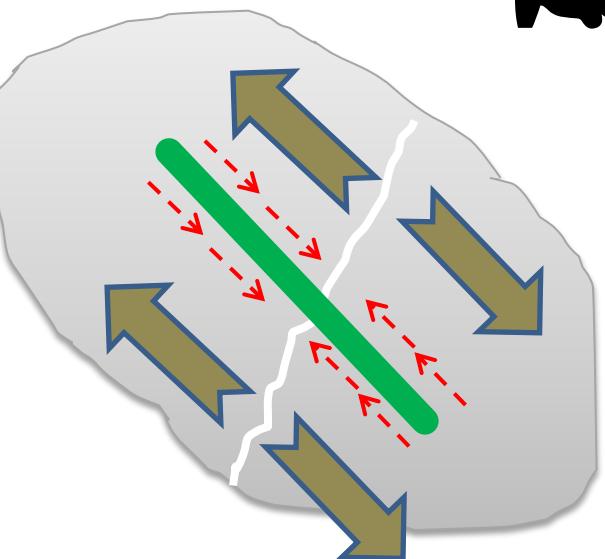
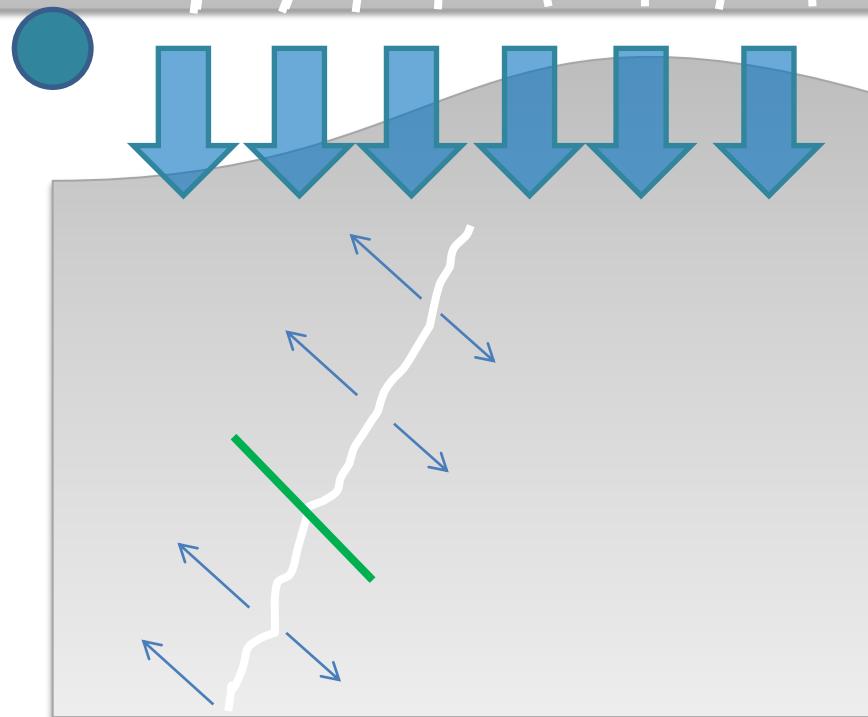
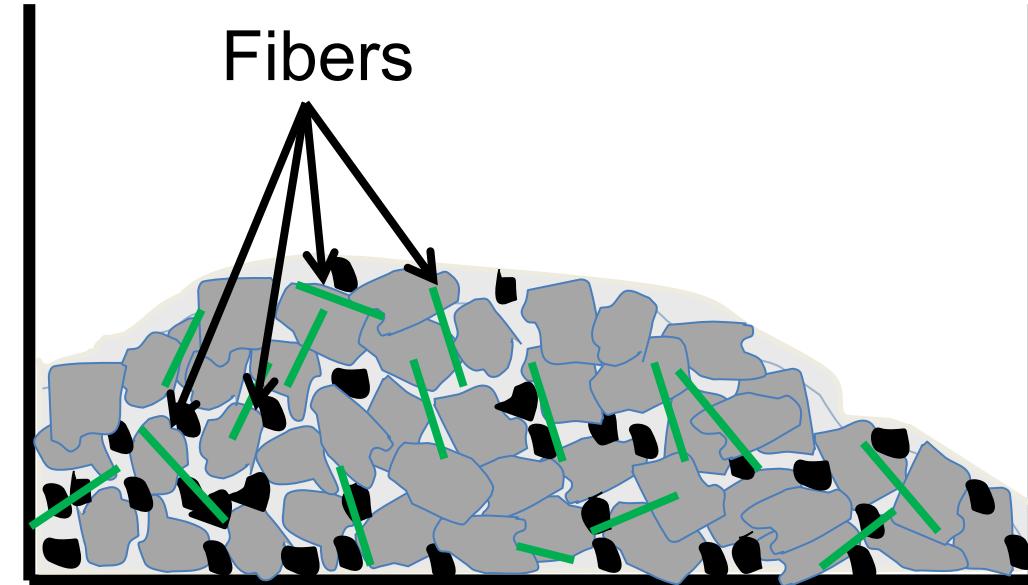
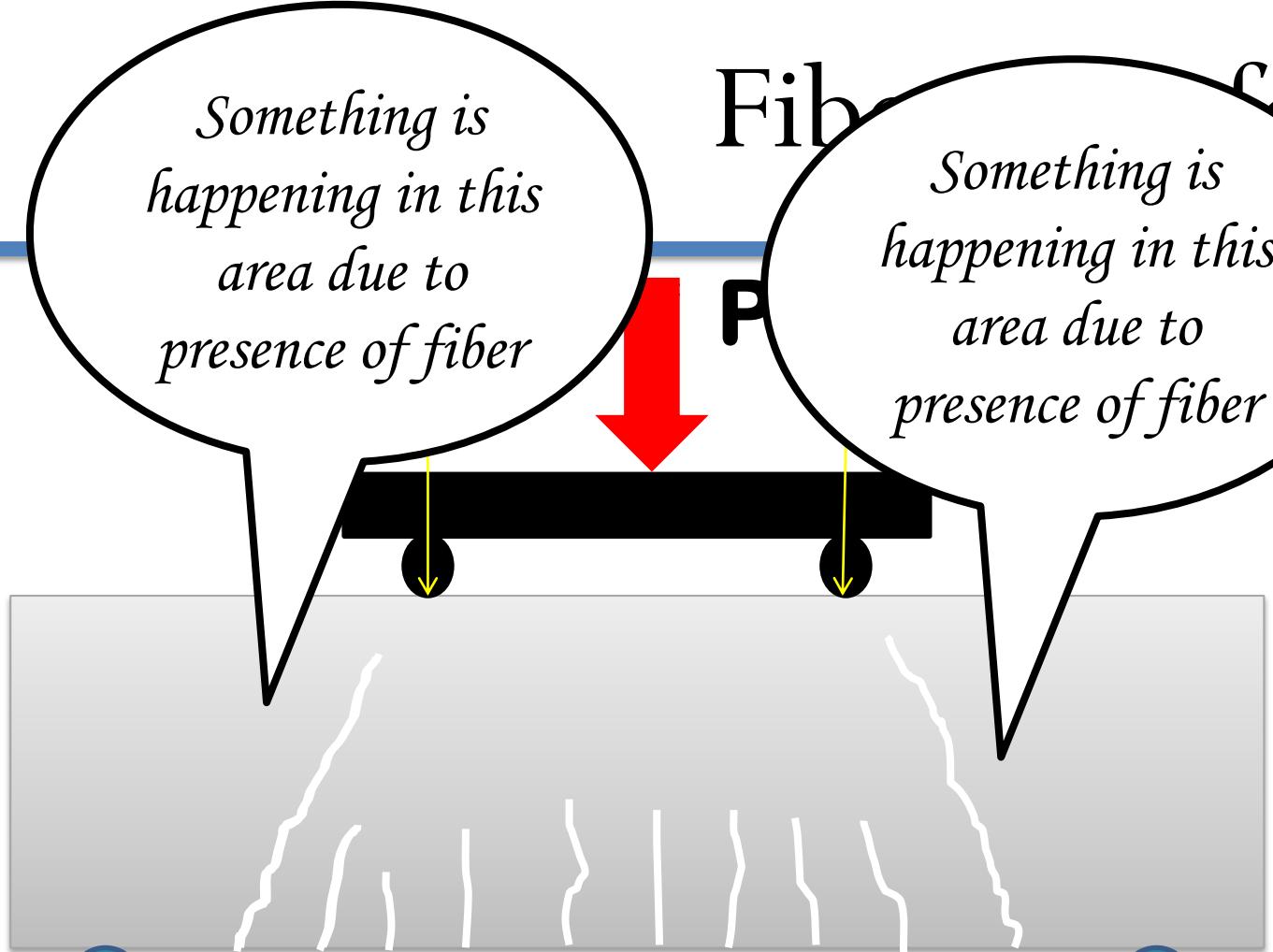
Carbon Fiber



Fiber Reinforced Concrete

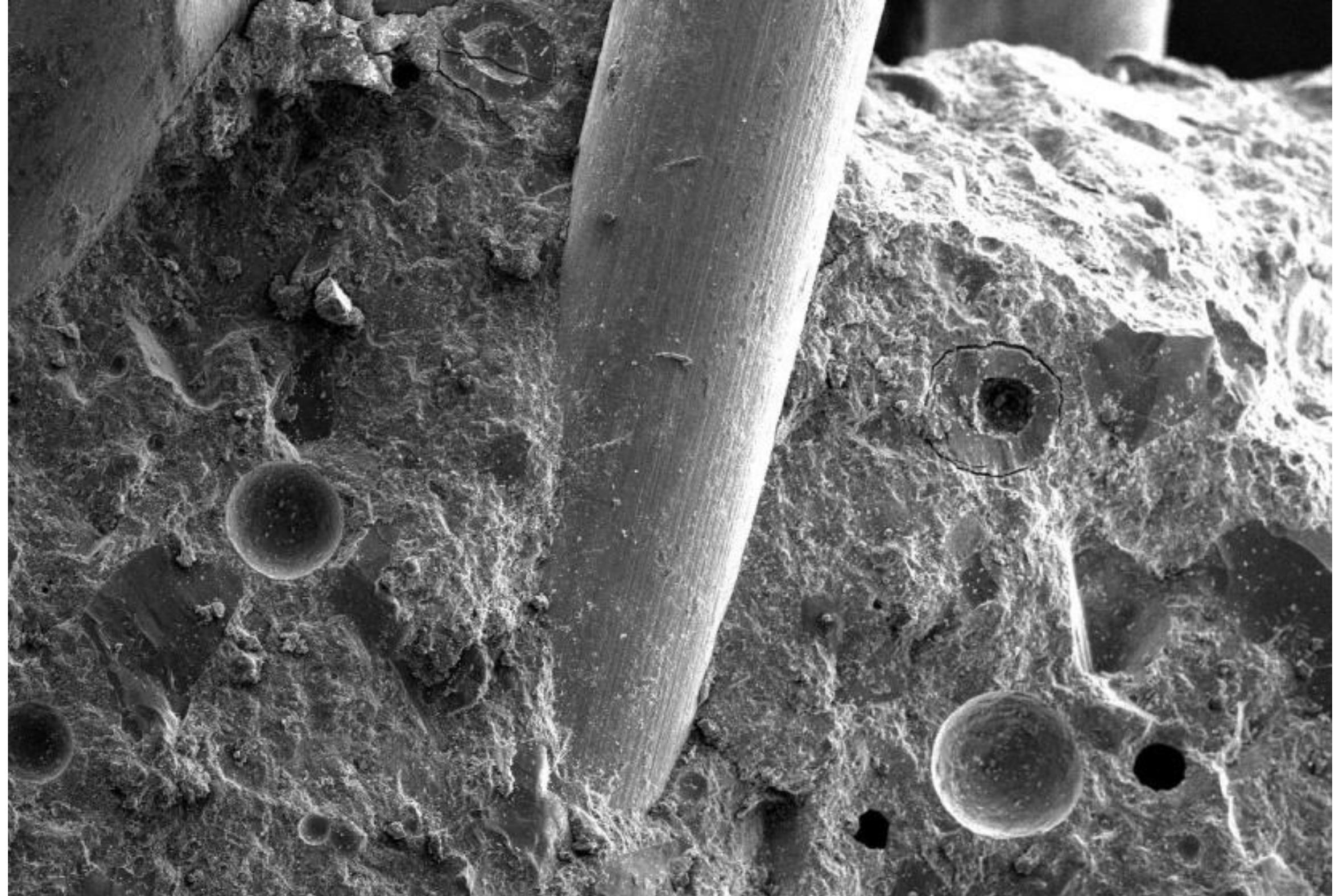


Fiber Reinforced Concrete



*Oh, it means
Fiber is resisting
the crack
opening*





7/27/2020

SEI 15kV

WD13mm

SS35

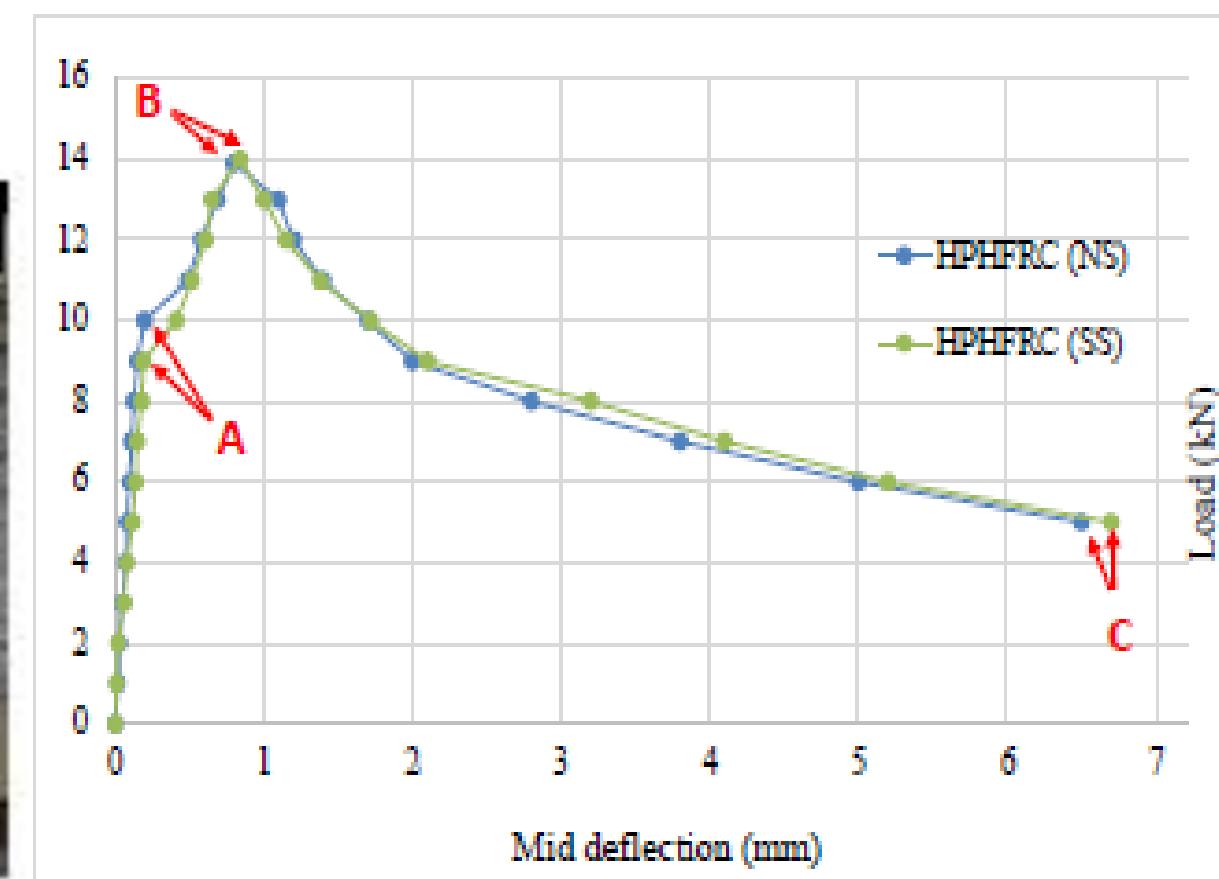
x50

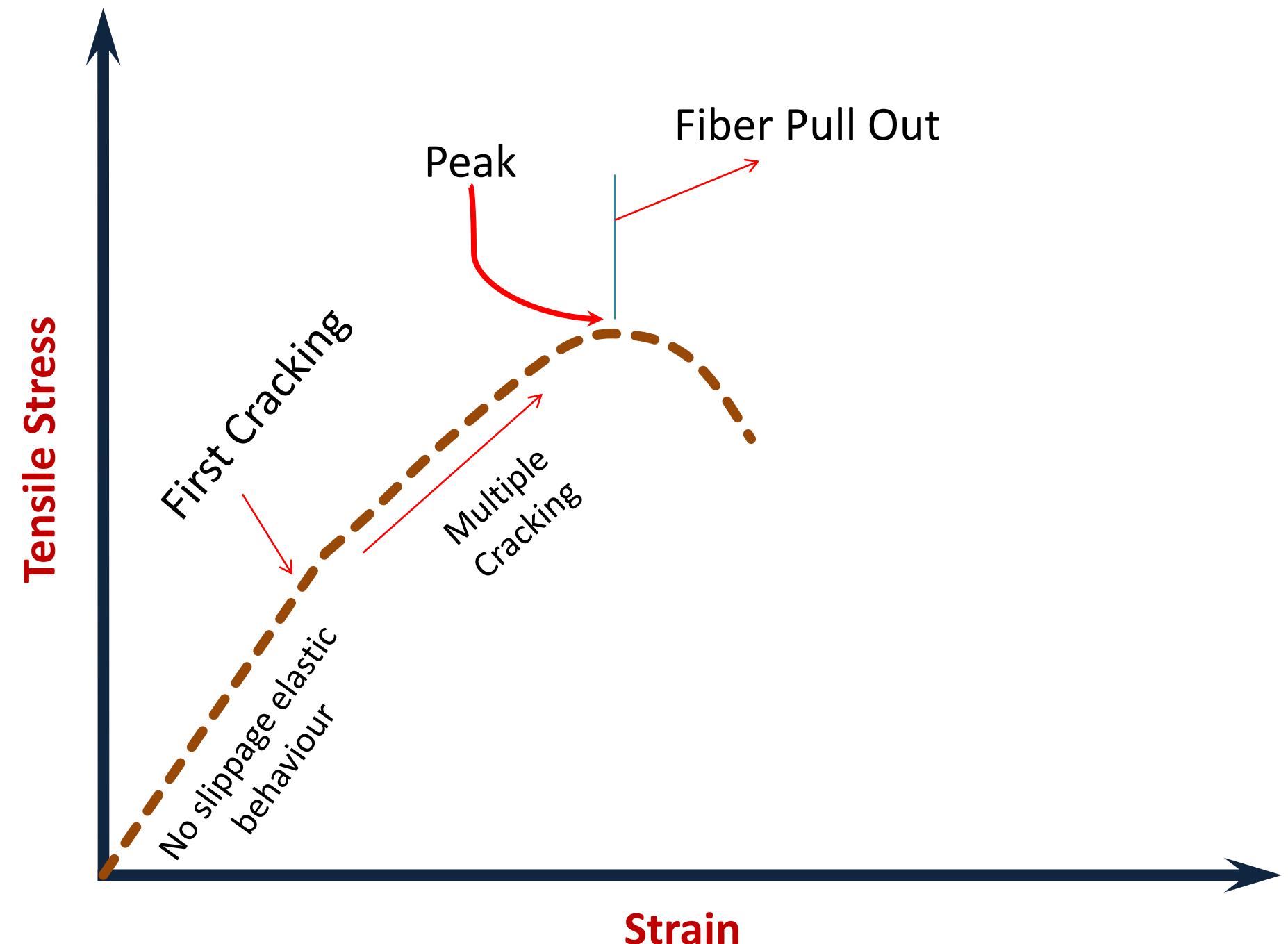
500 μ m

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SAI Labs, TIET Patiala

G.Mourya





Summary

Fiber Reinforced Concrete

 *Introduction*

 *Types of Fibers*

 *Mechanism of Fiber in Crack Bridging*

THANK YOU