

TECHNICAL TEXTILES – PART XV

REF: TT/ FEB 2022/ WK 4

ProTech or Protective textiles (Continued)

Different fibers used in protective textiles are:

The protective textiles are manufactured using high performance fibers. The important properties of these fibers such as lightweight, high tensile strength, durability, and different resistant properties like water, Ultraviolet (UV), chemicals, heat and microorganisms are possessed by various synthetic fibers.

Some of them are below:

- **Aramid Fiber** - Aramid fibers are used in making of different protective textiles. Both Meta-Aramid and Para-Aramid fibers are used in these textiles. Meta-Aramid fibers are used to make industrial protective clothing, racing driver’s suit, filter bag for hot gas, cargo cover, boat cover, fire hose etc. Para-Aramid fibers are used to make tire cords, radiator hose, racing car brake shoes etc.

META-ARAMID FIBER Vs PARA-ARAMID FIBER	
META-ARAMID	PARA-ARAMID
A semi-crystalline fiber	A high degree crystalline fiber
Manufactured by wet spinning method	Manufactured by dry-jet, wet spinning method
Temperature, chemical and abrasion resistant	High tensile strength and modulus

- **Carbon Fiber** - Carbon fibers have very good tensile strength, high thermal and chemical stabilities in the absence of oxidizing agents, good thermal and electrical conductivities and excellent creep resistance. **(Creep refers to the tendency of a material to slowly deform over a long period of exposure to high levels of stress.)** Considering its properties, carbon fiber is used in the manufacture of industrial textiles, medical implants and marine textiles.

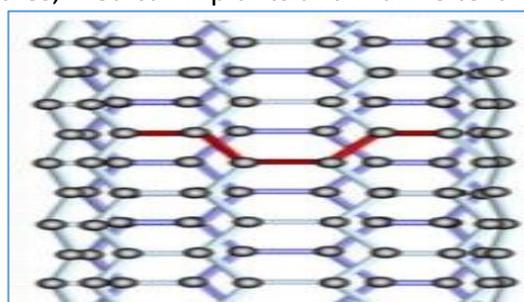


Fig 1.1 Molecular structure of Carbon fiber

Ref: pt.slideshare.net



- **Glass Fiber** - Glass fiber is a special type of synthetic fiber. It is formed when thin strands of silica-based or other formulation glass are extruded into many fibers with small diameters suitable for textile processing. These fibers exhibit properties such as strength, resistant to chemical attack, durability, and stiffness. These are used to make flame proof, water proof fabrics.
- **Polybenzimidazole (PBI) fiber** - It is a kind of synthetic fiber with very high decomposition temperature. It has very good thermal and chemical stability; due to its high stability, Polybenzimidazole fibers are used to make high-performance protective apparel such as firefighter's gear, astronaut space suits, high temperature protective gloves, welders' apparel and aircraft wall fabrics, racing driver's suit etc.

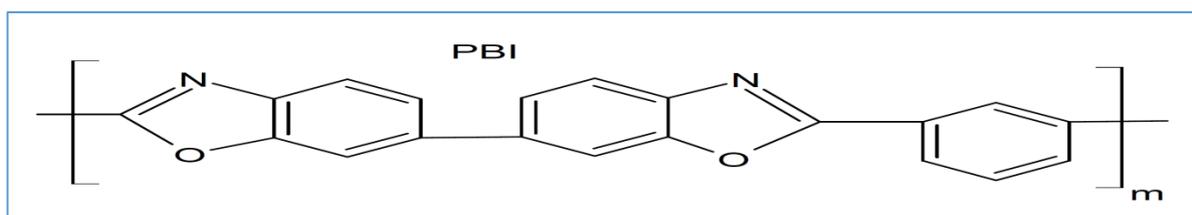


Fig 1.2 Chemical structure of PBI fiber

Ref: polymerdatabase.com

- **Polypropylene Fiber** - Polypropylene is also called PP. These fibers are used to make boat sail protective clothing.

References:

1. <https://www.technicaltextile.net/>
2. <http://www.technotex.gov.in/>
3. <https://www.compositesworld.com/>
4. <https://textilevaluechain.in>

.....To be continued.....

UNSCRAMBLE THE JUMBLE WORDS
GHTGHTLIWEI
XEBIHIT
ERCPE
AUTASTNOR

Last week's Answers: 1) RUBBER 2) POLYURETHANE 3) JACKET 4) INDUSTRIES

Wishing you a great week ahead!

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