



TECHNICAL TEXTILES – PART XIV

REF: TT/ FEB 2022/ WK 3

ProTech or Protective textiles

ProTech or Protective Textiles are textile materials that are used to make protective clothing. These textiles are used to safeguard against a variety of natural and man-made hazards like heat resistance, bulletproof, ballistic protection, chemical protection, temperature protection, etc.

This kind of fabric is mainly used for its functional properties rather than aesthetic properties. While protection is the main property of this fabric, other properties of the fabrics are also being considered.

PROPERTIES OF FABRICS USED IN PROTECTIVE TEXTILES	
	Lightweight and high durability
	Excellent drapes and good handle
	Micro-organisms, bacteria and chemicals resistant textile
	Water, wind and temperature resistant
	Fabric should have Ultraviolet resistant properties

Protective fabrics are used in various industries based on their functionalities. Some of the application areas for these textiles are -

- Flame retardant fabrics** - Flame retardant fabrics are used for clothing as well as non-clothing. The fire retardant apparels have an industrial need as they offer protection from fire and other heat intensive works. Flame, heat and splashes of molten metal etc. are hazards in many heavy engineering working conditions. The fire retardant apparels are used in refineries, iron and steel plants, aluminum plants and welding industries. Airlines, railways and ships are another key sector where fire retardant fabrics or apparels are used. These fabrics are also used in curtains, upholstery, blankets, bedding, wall coverings and blinds in office furnishings and hospitals. The fire retardant fabrics are manufactured either from fabric with flame retardant coating or fabric made of inherently flame retardant fiber. The general characteristics of the fire retardant fabric are very low fume toxicity in fire, high tear and abrasion resistance, breathable and comfortable, crease resistance etc.



- **Chemical protective textiles** - Chemical protective textiles are protective clothing that is used to avoid exposure to a variety of chemical and physical hazards. Workers wear this style of clothing in the chemical industry to secure them from dangerous chemicals.
Chemical protective clothing is used for protection of the human body against toxic chemicals which affects the body by absorption through skin. The durable chemical protective clothing is made of non-permeable textile fabrics such as PVC/Rubber coated fabrics. The protection is achieved by blocking the penetration and permeation of the chemicals through the fabrics in the clothing. The carbon-coated non-woven fabric, carbon-impregnated polyurethane foam, hard carbon microsphere-adhered woven fabric and activated charcoal cloth are developed to use in these textile category.
- **Radiation resistance textiles** - Radiation resistance is a type of protective clothing that is used to protect the body from radioactive substances. People working at cancer treatment clinics and nuclear power plants are required to wear this. The clothing used for this purpose should be permeable and should allow easy evaporation. Resistance to wear and tear, washable and durability are some of the characteristics of these types of textiles.
- **High-visibility clothing** - High-visibility clothing is the clothing that is highly luminescent color which is easily visible from any background. These clothing is a form of protective clothing which are made from fluorescent material with reflective tape or shapes added for extra visibility. It is used to make the wearer more visible to those around them. The concept of these clothing is based on the fact that certain colors easily reflect light against a dull background thus highlighting the user. The wearer of such clothing becomes visible during the night when light in the surroundings is less.
- **Ballistic protection textiles** - Ballistic protection includes protection of the wearer's body and eyes against projectiles and fragments of various shapes, size and impact velocity. Aramid, ultra-high modulus Polyethylene, and crystalline polymer-based fibers are the most often utilized materials for this kind of protective fabric. Bullet proof jackets are made from woven material as the combination of weave and the fiber characteristics influence the energy absorption characteristics of the jackets.

ARAMID FIBERS
These are man-made high performance fibers
The word ARAMID has been derived from Aromatic Polyamides
These fibers are rigid polymer chains, molecules are linked by strong hydrogen bonds
Good heat resistant properties
Used in aerospace, military applications

References:

1. <https://textilevaluechain.in>
2. <http://www.ittaindia.org/>
3. <https://www.technicaltextile.net/>
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5. <https://www.teijinaramid.com/>

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



UNSCRAMBLE THE JUMBLE WORDS
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DUSTINRIES

Last week`s Answers: 1) INTERIOR 2) SPUNLAID 3) COATED 4) READILY

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