TECHNICAL TUESDAYS

# POLYESTER AND ITS BLENDS – PART II

REF: TT/ JULY 2020 / WK 2

## Properties of Polyester fibers

Polyester fibers have several unique physical and chemical properties. These properties give them edge over natural fibers in many areas. These fibers are strong fibers which do not wear away easily; they retain their shapes and good for making outer wear clothing. Unlike cotton, polyester fibers dry quickly because of its hydrophobic nature. This property of polyester fibers makes them suitable in cold climate region.

Different properties of polyester fibers are -

- **Tenacity** – Breaking strength or the capacity of a fiber to support a load is called tenacity of that fiber. The crystalline nature of polyester fibers provides them good tenacity. The different tenacity levels are used for different end use. Medium level tenacity fibers are used for apparel whereas high tenacity fibers are generally used for sewing threads and other industrial yarns.

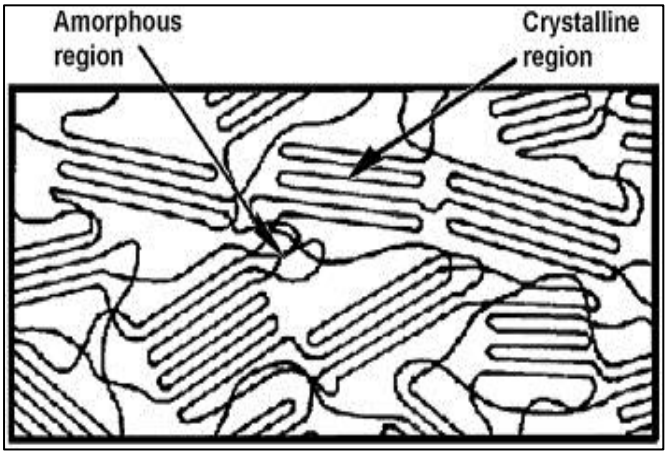


Fig 1.1 Molecular arrangement of Polyester fiber

Ref: sciencedirect.com

***Key Words***

**- The regions of the fiber in which molecules are arranged in orderly manner are called crystalline regions.**

**- The regions of the fiber in which molecules are not arranged in orderly manner are called amorphous regions.**

- **Hydrophobic Nature** - The crystalline structure of the polyester fiber resists the entry of water molecules into the polymer chain. This nature helps the fiber to dry quickly. However, these fibers attract fats, greases, oils, etc. Hence, it is difficult to remove oily substances from these fibers by soap but can be removed by dry-cleaning using organic solvents.
- **Thermal Properties** – Polyester fibers are thermoplastic in nature, which means they are capable of being molded when heated. These types of fibers are heated to soften them and then they are made flat, creased

or pleated. When cooled thermoplastic fibers retain the new shape. Polyester fibers are poor heat conductor and they have low resistance to heat. It melts on heating.

- **Wrinkle Resistant -** The crystallinity of the polyester fiber prevents them from forming wrinkles or creases. Repeated stretching and straining can cause distortion of the polymer chain as the Vander wall's forces cannot withstand much stretching. Hence, retains the shape.
- **Effect of Acids and Alkalis -** These fibers are resistant to acids. In alkaline condition, surface of the fibers gets lost by hydrolysis causing slight weight loss.
- **Sunlight** – These fibers withstands the UV radiations and is resistant to acidic pollutants in atmosphere.
- **Color Fastness –** These fibers exhibit good color fastness properties and retain its color after wash.
- **Micro-Organisms -** It is resistant to bacteria and other micro-organisms.

## Forms of Polyester fiber

Polyester fibers are produced in various forms exhibiting different properties; which makes them suitable for different end-use. The molten polyester is extruded from the reaction chamber in long strips. These strips are cooled and dried, and then these are broken into chips. These chips are melted again and extruded through a spinneret to create fibers. Depending on the forms which are required to produce, the polyester filaments are cut or mixed with chemicals.

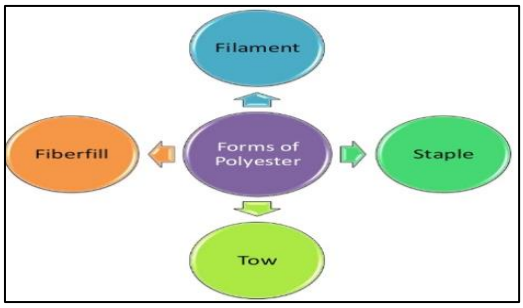


Fig 1.2 Different forms of Polyester

Ref: slideshare.net

- **Filament -** Polyester filaments are continuous fibers, which produce smooth and soft fabrics.
- **Staple -** Polyester staples are like cotton staples, which are spun into a yarn.
- **Tow -** Polyester tow is like polyester filament, in which the filaments are loosely arranged together.
- **Fiberfill -** Fiberfill consists of continuous polyester filaments which are voluminous. They are used to make bulky products like pillows, outerwear and stuffed toys.

…….To be continued……

| UNSCRAMBLE THE JUMBLE WORDS |
|---|
| LLFIFIREB |
| PHHYBIDROOC |
| UNGHLITS |
| LLINERYCSTA |

Last week`s Answers: **1) DUPONT 2.) TERYLENE 3) TEREPHTHALIC ACID 4) MONOMER**

Wishing you a great week ahead!

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