Polyester:

A Manufactured Fiber

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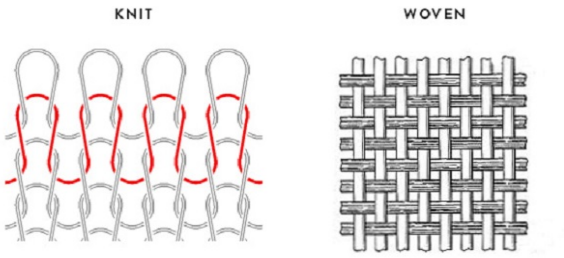
The textile industry features various fibers both natural and synthetic, as such as polyester which is a synthetic manufactured fiber. Produced from a chemical reaction amongst petroleum, water, coal and air; Polyester was invented in 1941 by John Rex Whinfield and James Tennant Dickson. Polyester was created using acids and alcohol to cause a chemical reaction where two or more molecules are combined, thus creating a large, stable molecular structure.[1] The polyester polymer is derived of Polyethylene Terephthalate (PET) which creates the foundation for synthetic fibers such as Polyester, Dacron and Terylene. The fiber became popularized in the 1970s, later becoming a fiber used across the United States. Polyester is manufactured from petroleum by products; however, most synthetic polyesters are not biodegradable which can cause harm to the environment.[2] Fabrics that are either woven or knitted from polyester thread or yarn are used in the manufacturing of various products ranging from apparel to home furnishings. Polyester is a well-known and desired fabric that has various end uses in both apparel and non-apparel items while also having a sustainable impact on the environment.

www.contrado.co.uk- Polyester Fabric Rolls

[1] "Polyester.", "Polyester," The Columbia Encyclopedia, 6th Ed, 2018, , accessed December 01, 2018, https://www.encyclopedia.com/sports-and-everyday-life/fashion-and-clothing/textiles-and-weaving/polyester.

[2] "The Composition of Polyester Fabric," EHow, March 19, 2011, , accessed December 01, 2018, https://www.ehow.com/info_8081016_composition-polyester-fabric.html.

As growth continues within the textile industry, there has been an increased demand for polyester fiber for apparel in particular. Polyester has various end uses in garments like: dresses, jackets, shirts, pants, sportswear, and childrenswear to name a few uses. Woven fabrics are those produced on large looms that interlace threads both horizontally and vertically. Knitted fabrics are those produced on knitting machines and "knits" yarns together. The yarns used for apparel are either woven or knitted to develop various fabrics like polyester which are used in the textile industry. Polyester is commonly used in items such as sportswear because it has wicking properties, high tenacity and durability. As it its hydrophilic and a strong fiber, it's designed to reduce the ability to trap warm air thus causing evaporation to become easier. Staple fibers like polyester have antimicrobial properties that create protection against body odors.[3] Notably, fibers like polyester have performance qualities making it useful for activewear and outerwear, it can be used as an alternative to other apparel fabrics such as cotton and nylon.



www.textilemerchandising.com - Difference between Woven Fabric and Knit Fabric

In contrast to apparel items, polyester is end used in various non apparel items such as those ranging from industrial textiles to household and institutional textiles. The polyester polymer is derived of Polyethylene Terephthalate (PET) which is thermoplastic and can be

[3] "Polyester Production, Price and Market Forecast," Plastics Insight, , accessed December 01, 2018, https://www.plasticsinsight.com/resin-intelligence/resin-prices/polyester/.

processed in a variety of ways.[4] Polyester is commonly used to manufacture water bottles as they are thermoplastic, thus allowing the plastic to be reshaped or remodeled into another form.[5] Miscellaneous polyester is used to manufacture industrial items like: ropes, tents, fishnetting, filters, fiberfill, and seatbelts to name a few uses. Household and institutional textiles vary from items such as towels, curtains, drapery, blankets, upholstery, and bed/table linens. Polyester is also used in the manufacturing of balloons, as they are made of Mylar - a type of polyester film manufactured by DuPont.[6] Primarily, polyesters ability to resist wrinkling, stretching, and shrinking while sustaining strong dimensional stability is why it's also used in the non apparel industry.

Polyester is both cost-effective and functional, despite having forceful environmental impacts during the production process. The fiber is petroleum-based, which is otherwise used as feedstock, but because of this, it is not biodegradable. Due to its complex molecular structure, when left in a landfill, polyester takes years in order to properly decompose. Polyester has severe impacts on the environment considering that the fabric is not biodegradable and the production process contaminates water.[7] The disperse dyes that are found in polyester are insoluble in water, resulting in harmful impacts to animal and plant life. Additionally, these dyes can have harmful effects on humans as they are toxic and can lead to cancer and other forms of illnesses. For

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[4] J. Preston and Malcolm P. Stevens, "Major Industrial Polymers," Encyclopædia Britannica, April 21, 2016, , accessed December 01, 2018, https://www.britannica.com/topic/industrial-polymers-468698/Polyesters#ref608740.
[5] "Camille," Natural Clothing, August 19, 2018, , accessed December 01, 2018, https://www.naturalclothing.com/what-is-polyester-fabric/.
[6] "Polyester," Ohio River - New World Encyclopedia, , accessed December 01, 2018, http://www.newworldencyclopedia.org/entry/Polyester.
[7] "Material Guide: How Sustainable Is Polyester?" Good On You, October 01, 2018, , accessed December 01, 2018, https://goodonyou.eco/material-guide-polyester-2/.

example, in developing countries like China and Bangladesh, individuals can be poisoned given

that the people who reside in these countries rely heavily on their water streams.[8]

www.dispatchLIVE.com - Biodegradable Plastic Bags developed in SA

Alternatively, there are efforts done to recycle and repurpose unused fabrics to lessen its negative impacts on the environment. Multinational clothing-retail companies such as H&M recycle fabrics from donated clothing and give donators 15% off towards their next store purchase. H&M stores nationwide have garment collection boxes where undesirable clothing is dropped off by customers and is later repurposed by manufacturing companies to make new clothing. H&M teams with their business partner I:CO, collect the in store boxes and sorts the clothing items based on given categories: rewear, reuse and recycle. Reworn clothing that can be worn again is sold as second-hand clothes. Reused clothes and textiles is turned into other types of products like cleaning cloth. Everything else is recycled, turned into textile fibers and used for things like insulation.[9] This form of repurposing causes less microplastic pollution in oceans, and

[8] "The Environmental Impacts of Polyester," Tortoise & Lady Grey, October 17, 2018, , accessed December 01, 2018, http://www.tortoiseandladygrey.com/2016/08/29/environmental-impacts-polyester/.
[9] "Recycle Your Clothes," H&M Group | At a Glance, , accessed December 01, 2018, https://about.hm.com/en/sustainability/get-involved/recycle-your-clothes.html.

saves on water consumption and energy use, which ultimately minimizes waste. Not only does recycling help industries save money, it helps consumers save money as well.

www.commons.wikimedia.org - H&M Logo.svg

In summary, polyester is a valuable fiber used amongst the textile industry as it is end used in a variety of products across the nation. Fabrics that are either woven or knitted from polyester thread or yarn are used in the manufacturing of products ranging from apparel, home furnishings, and industrial items. As a manufactured fiber, polyester has various qualities that make it desirable for use such as wicking properties, high tenacity and durability. The fibers ability to stretch and sustain strong dimensional stability gives it an advantage over fabrics like cotton and nylon. As polyester is petroleum based, it creates forceful environmental impacts because it isn't biodegradable, taking years to properly decompose. Various retail stores such as H&M are aiding in efforts to recycle and repurpose fabrics to lessen it’s negative impacts on the environment. Not only do sustainability efforts cause less microplastic pollution in oceans, it saves on water consumption and energy use, thus allowing consumers to live and shop amongst safe and environmentally friendly conditions.

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