



**Attachment**

# **Materials: Textiles**

# Types

## a. Cotton

Cotton is plant fiber commonly used in all types of apparel and textiles. Cotton can be combined with synthetic fibers, such as polyester. Cotton fabric is breathable.

## b. Polyester

Polyester is a type of plastic, which fibers are also used to make fabrics. Polyester fabrics are generally cheap and durable, and used for various types of apparel. Unlike cotton, polyester is not breathable. However, there are cotton and polyester blend fabrics.

## c. Wool

Wool is a textile fiber obtained from animals, mostly sheeps. Wool is generally more expensive than cotton. There are various types of wool, including cashmere and merino wool. Many suppliers sell 'generic' wool as cashmere and merino wool.

## d. Bamboo Rayon

Bamboo fabrics are not purely made of bamboo fibers. Instead, bamboo fibers are melted and mixed with chemicals to produce bamboo rayon fabrics. Virtually all so called bamboo fabrics are bamboo rayon fabrics. Many workers are exposed to extremely dangerous chemicals and toxic fumes during the refining process. Carbon disulfide is one such substance, that causes heart attacks, blindness and even psychosis.

Bamboo fabrics do have some benefits:

- Limited water usage
- Biodegradable
- No soil erosion (rather the opposite)
- No pesticides

Notice that most countries don't allow that bamboo rayon is described or marketed as organic.

## e. Organic Cotton

By definition, organic cotton is grown using methods that leaves a smaller environmental footprint on the environment. For example, organic cotton is only defined as such if the following criteria are met:

- No use of toxins
- No use of persistent pesticides (POP)
- No use of chemical fertilizers
- No use of GMO seeds

In the textile industry, organic cotton is the exception, not the rule. Further, the reduction of POP and chemical fertilizers reduces yields, and therefore results in higher prices.

## f. Nylon

Nylon is a durable polymer, that can also be used for textiles. Nylon can be blended with fibres or polymers such as cotton, polyester, and spandex.

## g. Spandex / Lycra / Estelan

Spandex (also known as Lycra and Estelan) is a synthetic fiber, with high elasticity. Spandex is often blended with cotton, or other fibers, and used in sportswear.

## Tooling

Custom tooling is generally not required when manufacturing textiles. However, some printing techniques require that 'stencils' are created. These normally cost \$50 to \$150 per print, and can be used for a large number of units.

## Standards

### a. GOTS

GOTS is the acronym for Global Organic Textile Standard, which is defined as follows:

1. Only fabrics that contain at least about 70% organic fibers can become GOTS certified
2. All chemicals such as dyestuffs and auxiliaries used must meet certain environmental and toxicological criteria
3. A functional wastewater treatment plant is mandatory for any wet-processing unit involved and all processors must comply with social criteria

A supplier can be GOTS certified, if they pass a factory inspection performed by an accredited third party. There are only a handful of 'GOTS accredited' inspection companies with offices in China:

- CERES GmbH
- Control Union Certifications b.v.
- Ecocert Greenlife

### b. OEKO Tex Standard 100

OEKO Tex Standard 100 is an international and independent testing and certification system for textiles. OEKO Tex Standard 100 'certified / tested' textiles meet various requirements, such as the following:

- Compliant with REACH (EU)
- Not containing Azo colourants, formaldehyde, pentachlorophenol, cadmium, nickel
- Compliant with US CPSC regulations

# Specifications

## a. Weight

Fabrics are generally not defined by thickness, but by their weight, in terms of grams per square meter (gsm). Lighter fabrics are thinner, less durable and often cheaper than more heavy fabrics. A few examples follow below:

- Baby clothing: 120 - 140 gsm
- T-shirt fabric: 120 - 200 gsm
- Pique fabric: 200 - 240 gsm
- Hoodie fabric: 280 - 350 gsm

## a. Fiber Composition

Some fabrics are made of a single fiber, such as 100% cotton. However, many fabrics are blended, consisting of two or more different fibers. A few examples follow below:

- 70% Cotton, 30% Polyester
- 95% Cotton, 5% Spandex

## c. Color system

Fabrics can generally be dyed according to a pantone color. It's important that you always specify the correct pantone code to your supplier. However, notice that 'custom dyed fabrics' (according to a certain pantone colors) often results in a higher MOQ - compared to if you buy a fabric in one of the suppliers standard colors.

## d. Printing

There are various types of textile printing techniques. Some of the most common follows below:

### Screen printing

Screen printing is the most common textile printing type, and can be used for both light and dark fabrics.

### Digital textile printing (DTG)

An inkjet printer, with textile ink, is printing text or graphics directly on the fabric - based on a file uploaded to the connected computer. As such, you don't need print tools, that can be relatively expensive - especially when you have many different prints.

### Block printing

Metal or wood blocks are cut to a certain pattern and then stamped on the fabric. This is a more traditional method, but is still used for certain types of home textile prints, such as curtains.

### Heat / thermal transfer printing

Heat transfer printing is a low cost method that adds a layer to the fabric. This method is often used for printing numbers or text. The print may crack after washing several times.