

The Effects of the Textiles Industry on Ecology Worldwide

We wear, use, and decorate, with textiles, yet we know very little about them and further more we know very little about their impact on our very own bodies when we use them. Further more we know very little about the impact they make on the ecology of our valuable Earth.

The textile industry encompasses many different types of fabrics shared between natural fibers such as wool, silk, linen, cotton, or hemp and then man-made fibers, the most common ones would be synthetic fibers namely polyamide, acrylic, polyester, elastane, or lycra. Most of these synthetic fabrics are made from petrochemicals, these are cheap and easy to care for, which is why they are becoming the industries miracle drug. The textile industry is becoming more and more divers due fabric process and means of employment. Most synthetic fibers are hard to recycle, (nylon takes 30-40 years to decompose) and they create heavy pollution.

Chemical Based Procedures of Textile Manufacturing

There are eight basic steps when producing textiles to be sold. The first step is called **Scouring**. This is when the raw textile materials in the natural form (dirt, pesticides, fungicides etc. are in the material) undergo a pretreatment to ready them to be worked on at a factory level. This includes wetting agents and peroxides stabilizers. **Bleaching** is the decolonization of the fabric; on natural fibers using Oxidative bleaching or reductive bleaching completes this process.

These steps contain sodium, hypochlorite, sodium hydrosulphite, and hydrogen peroxide. **Desizing** is the third step in the process. During weaving sizing agents are added to the fabric, after weaving the material is treated with chemicals such as acids, alkalis, or oxidizing agents in a process called desizing. **Fabric softening** is designed to prevent static cling and make the fabric softer to the touch by coating the fabric outside with a thin layer of chemicals. These chemicals contain lubricating properties and eclectically conductive properties. **Mercerization** is the step where fabric is treated with a caustic solution to making the fibers stronger, prevent shrinkage, improve luster and so on. High-end fabrics may undergo this process twice. The **Dyeing** process includes large amounts of dyestuff, thickening agents, water, dispersing agents, leveling agents, acid buffers etc. are used in the step of the process; most dyes are water soluble and applied as an aqueous solution. Lastly is the **Printing** step, this is when color is imparted onto the fabric. In this step different dyes and agents are added to the fabric along with various chemicals and acids.

Why this is Important and what Effect does it have on Humans?

It is found that 70% of the problems with manufactured fabrics occur in the finishing steps. The problems being with the fabric themselves, discoloration and so on, but also this step has the largest effect on humans. These chemicals used in the steps above impact us directly when we put these products on our bodies, causing unknown chemical seepage and allergies as well as known problems like rashes and so on. A majority of these chemicals have been known to cause cancer, genetic mutation and be generally toxic. Chemicals such as

- Alkylphenoethoxylates (APEOs)
- Pentachlorophenols (PCP)
- Toluene and other aromatic amines
- Dichloromethane (DCM)
- Formaldehyde
- Phthalates
- Polybrominated diphenyl ethers (PBDE's)
- Perfluorooctane sulfonates (PFOS)
- Heavy metals – copper, cadmium, lead, antimony, mercury among others

These chemicals provide a massive problem for humans, but also the environment.

The Impact on the Ecology and Economy

While the factory portion of the industry produces waste and pollution very seldom do we think of the raw fiber- agricultural side of the industry. For example, cotton is the most pesticide invasive crop worldwide. This crop also undergoes herbicide as well as often times chemical defoliants, these chemicals remain with the fabric even after finishing and release throughout the life span of that fabric. Another astonishing factor is how much water is used in growing cotton alone, for example it takes 257 gallons of water to create just a t-shirt from the growing process up to the finishing process. There are many other problems with the agricultural side of textiles. The UK is known for having agricultural as well as craft workers suffer from high exposure to organophosphate sheep drip problem from the wool industry located in those regions. Another example is that many synthetic fibers don't biodegrade at all (nylon and polyester). A different synthetic fiber known as Rayon is actually made from wood pulp that undergoes heavy acid treatments and plays a large role in the lumber industry. The last example from an agricultural stand point is the leather industry that is suffering

heavily from a lack in supply with solutions that are controversial to animal rights as well as the tanning and dyeing process causing pollution.

When textile manufacturers start producing, they often use massive amounts of water as every step in the finishing process is treated in water, this creates too many problems: Attaining so much water and second what happens to the water after it has been mixed with chemicals? Another problem is the disposal of used chemicals and waste, because many countries have strict pollution regulations (how to dispose of water, chemicals, regulations on water and types of chemicals etc.) and the cost to follow these regulations a common trend is to “outsource manufacturing”. The side effect of this procedure is that while manufacturing and its pollution is in and affects every country more countries with less strict regulations are taking the brunt of the manufacturing work and therefore for pollution. Countries in East Asia who do the most manufacturing due to lax government regulations, seem to have the highest amount of textile population and child labor as well as poorer working conditions given the higher demand, to serve the world market, though this is a huge money maker for those countries, their ecosystem and nation suffers for it.

In conclusion the impact of textiles is massive to the environment including chemical dumping in the world’s water supply, agricultural problems and then impairments to human bodies as well as human rights. However with more research done on the topic many organizations are creating more “eco” friendly ways of manufacturing. Where there is a will there is a way.