Fashionable Water

Water use and pollution in the textile dyeing process

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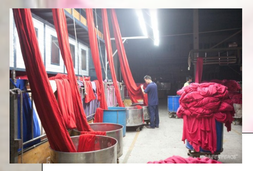

Objectives

- What aspects of the fashion industry are using and polluting the most water?
- Where in the world is this particularly prevalent?
- Are there alternatives? What would they be?
- Would these alternatives be able to be successfully applied and used in a particular case study?

Background: Textile Dyeing Process

Dyes are colored organic compounds used to impart color onto cloth. The current process for dyeing textiles is operative, but inefficient and harmful. The primary function of water in the dyeing process is to rinse excess dye off of the fabrics that have been colored. All of the current commercial dyeing methods use a significant amount of water, and pollute most of that water during the process.

•For each product manufactured, the typical water to dye ratio is 15:1.

•15-75 gallons of water are used to dye each individual clothing product.

•Textile dyeing is the No. 2 polluter of clean water on earth, following agriculture.

Background: China

The water use issues that the textile industry faces are exponentially worse in China, because of the textile industry and water resources there.

•China has some of the most severe water pollution in the world, with an estimated 70% of rivers, lakes, and reservoirs being polluted.

• One-fourth of the Chinese people do not have access to clean water.

•China is the top exporter of textiles to companies all over the world.

•An estimated 30% of China's water pollution comes from manufacturing goods for export.

•The textile dyeing industry in China produces 70 billion tons of wastewater per year.

Abstract

The problem we are going to address is excessive water use and water pollution in the textile industry, specifically in textile dyeing. The dyeing process demands a large amount of water for only a small output of dyed fabric. The excess water from dye, now polluted with chemicals and additives, is often dumped into lakes, rivers, reservoirs, or other water resources, and is one of the causes of industrial pollution. In order to address this problem, we are looking at alternative technologies (specifically a method used by DyeCoo), that use mediums other than water, such as carbon dioxide, to transfer dyes to fabrics. We are looking at a specific case study, a textile manufacturing company in Ningbo, China, to see whether or not these alternative dyeing methods could be applied to reduce excessive water use and pollution.

Alternative: DyeCoo

DyeCoo Systems is the world's first supplier of industrial carbon dioxide dyeing equipment. This dyeing method reduces pollution and water use in the textile dyeing process through using carbon dioxide dyeing technology. The process:

1. Carbon dioxide is heated and put under extreme pressure (1,100 pounds per square inch), so that it has properties of both a liquid and a gas.
2. The dyes are dissolved into the carbon dioxide fluid and absorbed by the fabric.
3. When the carbon dioxide cools, the clothes dry and the carbon dioxide returns to a gaseous state, so that 95% of carbon dioxide can be recycled and used again.

Case Study: The Youngor Group

The Youngor Group is a major Chinese textile manufacturing company. The core of the company is garment manufacturing and marketing. Many of the chemicals found in the wastewater produced by Youngor are soluble, making them likely to be transported downstream where they could not be traced back to a source. They can easily accumulate and multiply in their aquatic environment, meaning that the polluted water Youngor releases into the river will have long lasting effects. The Youngor Group Company is based in Ningbo, a city on the Eastern coast of China, with a population of approximately 2.5 million people. The citizens of Ningbo retrieve their water from a number of sources.

•Baixi Reservoir is one of the main resources serving Ningbo, supplying up to 700,000 liters of water to the city annually.

•Water sources in Ningbo have faced significant challenges

•Rivers around Ningbo have attracted large industries to the area

•Numerous water shortages

•Concern for human health as citizens continue to drink polluted water

Conclusion: Partnership

We propose that the Youngor Group should partner with DyeCoo to improve its current dyeing methods. This would be beneficial in several ways:

•By using a waterless technology like DyeCoo, Youngor would be benefitting by improving its technology and the surrounding community.

•Being such a large-scale manufacturing company, it has great impact on the local area's pollution and water consumption levels.

•Being a leader in China's textile manufacturing industry, setting an example of clean and water-conscious fabric dyeing could influence other textile manufacturing companies in the nation. This would be a huge step in fighting the pollution and waste of industrial China.

•In the fashion industry, environmental consciousness is increasingly popular. Using a waterless method of dyeing would give the manufacturing company an edge over competitors.

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