TECHNICAL TUESDAYS

SUSTAINABLE TEXTILES – PART IV

REF: TT/ MAY 2022/ WK 4

Innovation in textile machineries for sustainable textiles

Several innovations have been done in textile machineries for efficient use of resources and sustainable textiles. The long tube dyeing machine that operates on aerodynamic principle and works on ultra-low liquor ratio was developed for reduction in water requirement, effluent load and a reduced energy requirement. Machine with advanced intelligent rinsing system has also been developed to reduce process time and optimize water consumption.

Energy efficiency is an integral part of sustainability. Textile finishing is being operated with thermal processes, which has a severe impact on the environment. Also, the energy costs are very high. But with innovative ranges, advanced auxiliaries and right dyes selection machine manufacturers have succeeded to deliver productivity, cost efficiency, and environmental benefits. One of the developments in this line has omitted the need of reduction clearing process in polyester/cotton blended fabric in continuous dyeing. This led to significant chemical, energy and water saving. With the new machine developed for padding application, the liquor is not applied to the fabric by dipping it through a trough but by using steel rollers which transfer the required amount of liquor onto the fabric. This reduces the amount of remaining liquor and wastewater load.

The challenge of sustainability is to save natural resources without compromising production quality of the final products. Innovation in hot flue dryer helps to optimize the temperature and moisture conditions within the dryer along with efficient fixation of the dyes. Research is also being done in by the stenter manufacturer to use energy from the exhaust gas to preheat incoming fresh air entering the stenter up to certain percentage and save energy.

Sustainable raw materials

Sustainable raw materials are derived from eco-friendly resources like natural fibers, and recycled materials. Though natural fibers like cotton, wool, silk, and bamboo are more sustainable than synthetic fibers, there are still environmental concerns associated with them. For e.g. cotton, requires a huge amount of water and pesticides to produce.

The materials used, processes involved, quality of life led by laborers and the afterlife of the product are evaluated and quantified. The resources and materials used for sustainable textiles are obtained

from renewable or recycled sources that are produced with limited impact on human life and environment.
Sustainable materials can be categorized in the following ways –

- **Organic fibers** - Crops cultivated with bio-fertilizers and organic manures without the usage of pesticides, chemicals or synthetic fertilizers.

  E.g. - **Organic cotton** -Conventional cotton is not environmentally friendly as pesticides and insecticides are used when growing the cotton causing pollution and also ill health. Organic cotton however is grown without the use of chemicals, making it much more environmentally friendly.

  Hemp - Pesticides or insecticides are not needed when growing hemp and it improves the condition of the soil that it is grown in.

  Bamboo - Majority of the bamboo is eco-friendly as it requires no pesticides or fertilizers and needs little water. Additionally, it helps to improve the quality of the soil, and can help to rebuild eroded soil. It is very sustainable.

  Soy - Soy fabric is made from a by-product that occurs during the food manufacturing of the Soya bean. Soy fabric is one of the most environmentally friendly fabrics since it is derived from a waste material.

  Wool – It can be an environmentally friendly fabric if the animals need to be treated well and live in humane conditions. The sheep manure should not enter the water supply.

  Pina fabric - Pineapple leaves are used to obtain pina fibres. The pina fibres are extracted from the pineapple leaves by hand scraping, decortications or retting.

- **Eco-textiles** - Eco-textiles refers to the fabrics, clothing and accessories that have been manufactured, produced, and processed in an environmentally-conscious manner. This manner reduces any negative impact in the form of pollution or damage to the planet.

- **Recycled and Biodegradable** – The fibers that are biodegradable are broken down into pieces to produce more textiles or fibers. Recycled cotton is a sustainable alternative to prevent unwanted waste disposal. Other than that, it significantly contributes into savings of natural resources and reduces pollution from agriculture.

- **BCI (Better cotton initiative) cotton** – BCI cotton are sustainable raw material as it focuses on improving livelihoods and economic development, reducing the environmental impact of cotton production, optimizing the use of pesticides and reducing the use of water and energy.

- **Textile processes and sustainability -** Fabrics are produced by taking into consideration each step from cultivation to finishing process using lesser chemicals and effluents and better environment.

Fig 1.1 Sustainable textiles icon
Ref: stock.adobe.com

References:

1. https://www.2bfuntex.eu/
2. https://www.study.com/
3. http://www.fibre2fashion.com/
4. https://textilevaluechain.in/
5. https://www.intechopen.com/

…….To be continued……

UNSCRAMBLE THE JUMBLE WORDS
NNIVETIOVA
NISTSUAELBA
CITISEPESD
MICSALCHE

Last week`s Answers: 1) APPLICATION 2) PROPERTY 3) CRITICAL 4) COLLAPSE

Wishing you a great week ahead!

Technical Tuesdays is a knowledge sharing initiative by Resil Chemicals Private Limited
arc@resil.com | www.resil.com.