Recycling of Textiles: A Step towards Sustainability

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Recycling of textiles has become very important in the recent years. The rise in living standards has caused the demand for textile and clothing to grow exceptionally. Like any other industry the textile industry also generates all types of industrial waste. Many useful materials can be recovered from these materials by using new technologies. The wastage of raw material can be reduced by improving manufacturing techniques. The wastage of raw materials at each stage can be reduced, saving major inputs. During the process of recycling certain kinds of wastes such as solid base can be recovered by adopting improved technologies, where these waste can be converted into useful materials for other applications. In environment based production strategies, environmental protection becomes an economic activity that's means to be considered through all processes from designing to packaging. A large amount of fibrous waste is generated every year. For environmental and economic reasons, industries and scientist have been inventing various technologies to recycle this textile waste.

Key words: Recycling textiles, environment protection, waste materials.

Introduction

Textile recycling is an old and well established industry. Undesired and unwanted materials left over after the production of textiles can be reused in many ways. Like all other waste textile wastes also originate from the community through a number of streams including fiber , clothing and textile manufacturing industries, consumer, the commercial and service industry. Textile waste like all other wastes is characterized into biodegradable and no biodegradable waste. In India the total cotton fiber consumption is about 26 lakhs tons per year out of which maximum 2, 10,000 tons of cotton dust is produced during manufacturing processes. The problems associated with micro dust have become very serious since it has no resale value i.e. it is not recyclable. It is also pollutes the surroundings and if not degraded appropriately leads to infectious diseases and release of foul odor. Though, most of them are disposed off by burning, which increase carbon dioxide level in the atmosphere which adds on to the global warming.

Rapid industrialization has degraded the environment. The attitude of industrial managers towards this degrading environment has begun changing and many have taken measures in order to protect the environment. This has led to industrial management. Parameters responsible for pollution include chemicals discharged into different natural sources. The health and safety of those working in industries also needs to be protected.

Pre Consumer Textile Waste

Pre Consumer Textile waste is that waste which is generated by the processing of fibers and production of textiles and yarns. Non-woven textiles, technical textiles and footwear including cut offs, shearing, selvedges, rejected materials or under grade garments also come under this category.Pre consumer textile waste is considered as a "clean waste ".

Post-Consumer Textile Waste

This wastes consists of any type of household textiles or garment (sheets or towels) that are discarded because they are either damaged worn out, outgrown or out of fashion.

Industrial Textile Waste

This waste is generated from commercial and industrial textile application including wastes such as carpets and curtains, hospital wastes in addition to industrial applications such as conveyer belt, filtration etc. Industrial textile waste is known as dirty waste. [1].

Recycling

The process of converting used waste into new products to prevent the waste of useful materials, reduce the consumption of fresh raw materials. Reusing old clothing, fibrous material clothing scraps to manufacture new textiles can reduce environmental pollution. Textiles found in municipal solid waste mostly consist of discarded clothes. Over 1 million tons of textiles are thrown away from domestic sources out of which only 25% or recycle. Household discards 3 to 5 % of textile waste. Textile waste is increasing at a very fast rate each year. Recycling these textiles can save up to 15 times the energy used in making the original garment. Over 70% of the world's population uses second hand clothes. [2]

Importance of Textile Recycling

Textile recycling is important for both environmental and economic benefits. Textile recycling avoids many polluting and energy consuming techniques that are used to make textiles from new raw materials

- The requirement of landfill is reduced. Textiles lead to many major problems in landfills. Synthetic materials do not decompose easily, woolen garments produce methane that increases global warming.
- Pressure on new raw material is reduced.
- It leads to the balance of payments as we buy lesser materials for are requirement.
- As fibers are locally available they do not have to be imported, hence reducing pollution and saving energy.
- Lesser energies consumes while producing a new textile as it does not to be re-dyed or scoured.

Process of textile recycling

Sorting:

The collected textile according to their type and color.

Shredding and pulling

Textile materials are shred or pulled into fibers. Depending upon the use of yarns other fabrics may be added.

Carding

The blended mixture is carded to clean and mix the fibers.

Spinning

The yarn is respun to make it ready for weaving and knitting.

Types of recycling categories

Cotton Recycling

Cotton is recycled by combing together the scraps excess yarns and wastes that is left over and is not required for production by clothing manufacturers. These cotton items are shredded down into fibers and are blended together with different types of textile fabrics. Once blended the fibers are spun into yarns and then are ready to be weaved or knitted. Articles of cotton are not suitable for selling in low price stores, they are sent to recycling mills to be processed.

Wool Recycling

Recycled wool is made by tearing apart the existing wool fabric and re spinning the resulting fibers. The recycling process makes the wool fiber shorter. The recycled wool can be mixed with raw wool of another fiber such as cotton to increase the fiber length. When separated into new yarn or fabric the shorter fibers become less durable and less resilient than new wool.

Polyester Recycling

The fabric is shredded and granulated to form small pellets which are then broken down into chips. These chips are melted and spun to make polyester fabric. Polyester is manufactured by using previously processed polyester items. In textiles, recycled polyester clothes can be created by using old clothes. Polyester fibers made from recycled plastic container are often referred to as recycled polyester. PET (Poly Ethylene Terephthalate) is a form of strong and light weight polyester. [3]. The world's first garment recycling program started by the Patagonia Company which enabled the customers to bring their used clothing back for recycling. [4]

Carpet Recycling

A carpet is made using several kinds of materials. The separation and recycling of carpet fibers is very difficult. Carpet recycling involves identifying and separating carpet fabrics. The types of carpets are grouped according to their fiber components. Then the carpet is run through a shredding or shearing machine to separate its layers. The separated fibers can be reused for making new carpets or carpet cushions.

Used Clothing

Used fabrics have the possibility of being used by saving old clothes and turning them into rugs, cover, etc. This helps in recycling of fabrics.

Used Footwear

Footwear is an essential part of everybody's life as they protect our feet from hazardous situations and extremes of weather. Recycling used footwear is quite difficult. This is due to the various types of materials used in making them. Plastic, rubber, leather and resin. Every material has a different method of recycling. All footwear except shoes can be recycled very easily. Shoes take a lot of time to be recycled.

Leather Recycling

Recycling leather involves treating and recycling leather that is discarded by the leather producing industries. The leather residues are shredded and the resulting blend is glued together with resin and catalyzers. This glued leather is pressed between molds of all shapes and sizes or directly on sub layers, forming plywood, and then shaped into the desired product. The final product has a polished finish and does not require any more polishing.

Conclusion

The recycling of textiles has been taking place for many years. In the recent years the recycling of textiles has begun to be seen as a step towards a clean and pollution free future. Clothing being an important part of a human being's life needs to be recycled. A sustainable future could be possible only if an initiative is taken to do so.

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