

The Role of Textile Engineering in a Circular Economy

Aminoddin Haji

Department of Textile Engineering, Yazd University, Yazd, Iran

ahaji@yazd.ac.ir

Abstract

The textile industry is at an inflection point, with increasing pressure to account for its enormous environmental footprint-related to resource depletion and increased textile waste. The linear "take-make-dispose" model can no longer be sustained, therefore, there needs to be a pivot towards a circular economy. This presentation will focus on the important role that textile engineering can play in this transition.

The new material and process innovations that are revolutionizing the life cycle of textile products will be examined. Particular attention will be paid to the design and development of sustainable materials such as biodegradable fibers; and high-performance textiles created from recycled feedstocks. The presentation will touch on engineering challenges and advances in the design and development of eco-friendly materials that also meet the high-performance and aesthetic expectations of the marketplace.

In addition, this speech will cover the new developments in mechanical and chemical recycling technologies that turn post-industrial and post-consumer textile waste back into raw materials. It will speak to the principles of "design for circularity", making products that are durable, repairable, and recyclable, through dis-assembly.

The speech will also touch on the developments of a closed-loop manufacturing framework, making an effort to minimize the waste and maximizing the use of resources throughout all stages of the product development and manufacturing processes. I will also present case studies and examples of these implementations that showcase how feasible and economically viable circular business models have been created in the textile industry.

In conclusion, this talk will claim that textile engineering is not just an element, but a foundation of a sustainable, circular textile industry. Textile engineers are leading the future with innovative materials science, process engineering and product design. Inspiration can be found in the success of textile engineering that promotes and advance societal bound. The work of textile engineers will show that fashion and sustainability can happen together, while contributing to the health of the planet and enjoy a more sustainable economy.