

## Upcoming Trends in Sustainability & Textiles

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### Introduction

As the world has begun its shift towards a more sustainable future, many are concerned with textile industry waste associated with the mass production processes that dominate supply chains. The overproduction of textiles and garments as well as the general waste that occurs during the textile production process has contributed greatly to global pollution. For example, “in 2017, of the 16.9 million tons of textile waste generated in the United States, only 15.2% was recycled” (Brown, 2021). These statistics only account for the waste generated by the United States in a single year (2017). When considering this outcome on a global scale, it’s clear the waste generated by the textile industry poses a considerable problem. With growing global awareness of this issue, industry stakeholders have begun to indicate interest in investing in more sustainable practices and an overall more environmentally conscious industry. This paper will discuss the upcoming trends in sustainability for the textile industry through examination of companies that showcased their new sustainable products and ideas at the 2023 ITMA exhibition in Milan, Italy.

### Use of Recycling

Although the concept of recycling is not a new idea, the various processes that many companies have introduced to create a

circular recycling system during textile production have proven to be innovative. Companies such as PROLEN and MesdanLab utilize circular economic solutions to reduce waste during the textile production process. PROLEN produces functional polypropylene yarn and has shifted towards a more sustainable approach to creating these yarns. They begin with pre-consumer and post-consumer polypropylene waste that turns into PROLEN RECYCLE chips which are later used to create PROLEN RECYCLE yarn. This sustainable yarn can then be used to create their functional clothing line which, after consumers are finished using, is turned back into waste to complete the circular recycling system.

MesdanLab utilizes denim to recreate a similar process. They have created a new machine that starts sustainability from the beginning stages of production. MesdanLab utilizes post-consumer denim waste, such as a pair of jeans, and uses the machine to cut and shred this denim into fibers that are then put through carding and drawing processes and ultimately spun into yarn. This recycled denim yarn is then able to be knit or woven into another denim apparel item which can later be put back through the recycling process to complete the circle.

These are just two companies among many that are creating machines similar to these to facilitate circular recycling systems that create a more sustainable industry. ITA

Augsburg utilizes their Recycling Atelier to assist in enabling the path of secondary raw textile materials toward high-quality products through machinery as well. Similar to PROLEN and MesdanLab, they begin with textile waste that is sorted, identified by material, processed and prepared, and then recycled mechanically or chemically to be upcycled into a new textile material.

In addition to new machinery, other companies showcased the many ways that they utilized recycling to bring sustainability and innovation into the textile industry. Science Park Boras Textile & Fashion 2030 showcased many of their Exposé products that utilized recycling. For example, Twood, or textile-wood, was showcased as an innovative new material made of post-consumer used denim. The company, TWOOD AB, compressed denim into a wood-like material that is physically similar to wood but soft like denim as shown in Figure 2. This was portrayed in use as heels for boots as well as the base for a guitar. In addition to this, Science Park Boras exhibited a shirt from Guringo Design Studio that was made from a completely biodegradable material that is meant to deteriorate over time and return to soil to be used as a biogas. They explained that this was created to accommodate the fast fashion fad that has taken over the textile industry. With more people wanting to buy clothes only to wear them for a short period of time, many of these apparel items end up in a landfill. To combat this while simultaneously adhering to the fast fashion trends, they created a shirt that could be worn for a short period of time before being recycled into the ecological system as shown in Figure 3.



**Figure 2. TWOOD Lennart Sjöberg. (n.d.). TWOOD.**  
<https://digitalexpose.se/objekt/twood/>



**Figure 3. Streamateria Running Top Guringo Design Studio. (n.d).**  
**Streamateria Running Top.**  
<https://digitalexpose.se/objekt/guringo-running-top-2/>

### Use of Transparency

Transparency to showcase sustainable practices represents another upcoming trend in the textile industry as well. Science Park Boras introduced their Gina Lab Transparency Project for the Gina Tricot company that is partnered with Papertale as shown in Figure 4. The project attached an NFC-chip to each garment that Gina Tricot was selling which allowed consumers to scan through the Papertale app in order to see the entire process of production with social and environmental insights into how the garment was manufactured. This allowed for full transparency for the consumers and proves their steps towards sustainability. From this, the transparent clothing, which was sold at three times the normal cost, was sold out entirely within two hours. This illustrates how consumers place value in transparency and sustainability in apparel products ultimately demonstrating the reason why this is an emerging trend.

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**Figure 4. Gina Lab Transparency Project**  
**Gina Tricot. (n.d.). Gina Lab**  
**Transparency Project.**  
<https://digitalexpose.se/objekt/gina-lab-transparency-project/>

Another company that exhibited transparency for sustainability at ITMA was Haelixa. Haelixa created a physical traceability technology through DNA markers for products. These markers carry unique identities that can be traced along the supply chain, allowing for consumers and companies alike to trace the products to ensure sustainable practices. These can be used to verify the claims of where the products are manufactured throughout the entire production process. This ultimately prevents companies from making generic claims about the sustainability of their product and informs consumers about the environmental and social impacts of the product.

### Use of Artificial Intelligence

Article intelligence, or A.I., has been increasing in popularity throughout multiple industries including the textile industry. Artificial intelligence has been most notably utilized in the textile industry to assist in sustainability. For example, Smartex is a company centered around artificial intelligence for textiles. They have created a machine called Smartex Core which produces less waste for better fabrics. It utilizes A.I. to identify and prevent textile waste at the source and prevents over 80% of defects that occurs during the knitting stage. Through smart technology, the machine learns the most common mistakes and when

they are made and shifts to prevent them from happening again. Smartex Core not only reduces fabric waste, but saves energy, lowers CO<sub>2</sub> emissions, and saves water. This ultimately contributes to sustainability through the production process. Science Park Boras also introduced an artificial intelligence system that assists in sustainability in the textile industry from their Mikro Fabriker project. This A.I. system detects defects in pre-loved clothing and identifies the location of it before suggesting an upgrade to refresh the garment, giving it a new life. This allows clothing pieces to be used again and prevents waste. Science Park Boras showcased multiple designs that had been renewed with the use of their A.I. technology such as a shirt with an ink stain in the breast pocket that was suggested to be upgraded with a patch to cover. There was also a shirt with small holes all over the right side and the technology suggested embroidery to cover. Both of these can be viewed in Figure 5 and Figure 6. This, as technology advances, could prove to be extremely beneficial in upcycling clothing to prevent waste.



**Figure 5. Patched Shirt**



**Figure 6. Embroidered Shirt**

**Conclusion**

Sustainability in the textile industry continues to be of great importance to not only companies but consumers alike. These emerging trends related to production and post-production processes suggest that the industry is moving towards a more sustainable future. The use of recycling throughout the production processes as well as creating clothing that can be recycled was a major theme throughout the ITMA

exhibition. Many companies showcased their innovative machinery that assisted in recycling to create new fibers and some portrayed their products that used innovative recycled materials. With this, transparency throughout these processes have shown to be of the utmost importance to building a more environmentally conscious future. With products that have been created with the sole intention of allowing consumers to track the product’s sustainable journey throughout production, many companies have begun to focus on traceability. Finally, with the rise of artificial intelligence, a few innovative companies have taken advantage of this technological capability to assist them in creating a more sustainable future.

**References**

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