

# Case Study


Sector | Textile

## Twine Solutions



Twine Solutions was established in 2015 with the vision of leading the digital change in the textile industry. The field of traditional thread and yarn dyeing involves the use of many chemicals and large amounts of wastewater. Twine has developed a unique technology for thread and yarn dyeing that allows for precise dyeing with minimal waste, zero water usage and smaller amounts of chemicals.

 Consultant

 Efficiency Process



LCA (Life Cycle Assessment)

## Environmental Goals



Reduction of hazardous waste by **50%**



Additional reduction in water usage by **25%**



Additional reduction of CO<sub>2</sub>e emissions by **45%**



**50%** savings in power consumption

**Dana Hochberg, Twine's Sustainability and IP Manager:**

*"As a company that puts the values of sustainability at the forefront of its mind, and strives to bring to the market products that can improve the environmental impact, Twine created a product Life Cycle Assessment in collaboration with 'Sher Consulting and Training' company. The purpose of the project was to examine in depth the environmental impacts of the system and to examine ways of future developments and improvements. We thank the Israel Resource Efficiency Center (IREC) for the funding and 'Sher Consulting and Training' for the fruitful and professional cooperation."*

## LCA | Life Cycle Assessment

### Performing LCA by stages:

- Examining the raw materials;
- Examining the production and packaging process;
- Product transportation and distribution

**LCA (Life Cycle Assessment)** is a tool for measuring and analyzing all the environmental impacts of a particular product, service or technology, while examining the full lifespan of that product. The analysis makes it possible to examine diverse environmental impacts and make a comparison between different products from the same category, thus allowing the customer to choose the products with the lowest environmental footprint.

The process is anchored in the Israeli (14040) and international standards (ISO 14040, ISO 14025, EN 15804), and its publication in comparative databases requires verification by an independent third party.

## Environment | LCA

### LCA for Twine Solutions

The LCA process was carried out by the company 'Sher Consulting and Training' using SimaPro software, which uses built-in models of environmental impacts analysis of raw materials and processes. The collected information was entered into the model and optimized by the consultants. The product reflects the environmental impacts of the product being tested (dyed yarn on the TS-1800 system).

A life cycle assessment (LCA) was carried out for the dyeing process, where the limits of the research are Cradle To Gate, starting from the source of the raw materials, through the production of the materials required for the dyeing process, to the dyeing of the threads themselves, including the waste treatment. The goal of this research was to provide quantitative results for the environmental impacts of the process, to examine possible scenarios that may affect the environmental results and to enable evaluations of improvements for the future generation systems.

### Environmental effects and ranking according to stages and main components:

The research has shown that the environmental inputs are highly dependent on the location of textile production (Europe/China) as well as the type of dyed yarn. It was also found that the inputs with the highest contribution to the environmental impacts are:

- Power consumption
- Air transportation
- The production of the activated carbon filter
- Waste treatment
- Ink production
- Production of the yarn (polyester)



## Economic and environmental benefits

### Scenarios / potential benefits from the LCA process

In light of the main environmental impacts, the following scenarios were examined as part of the study:

- Improving the energetic efficiency of the system
- Improving the efficiency of the waste treatment system
- Reusing one of the waste components

The expected benefits following the implementation of the actions examined:

- 50% savings in power consumption
- Reduction of hazardous waste by 50%
- Additional reduction of greenhouse gas emissions by 45%
- An additional reduction of 25% in water use

## Additional benefits of the company

The textile industry is making great progress in examining the environmental impacts and is thoroughly examining the use of new sustainable technologies. Today, technology companies are required to present environmental impact assessments based on LCA studies. Thanks to this type of research, brands and manufacturers can understand the environmental value of using a new technology such as digital thread and yarn dyeing systems.

Twine will continue to improve the environmental impact of the products and examine additional scenarios such as waste treatment, optimization of product design, use of renewable energy in the company's production lines and alternatives to air transportations.