



MED TEST Case Study

## TEXTILE sector — TUNISIA

# Teinturerie Finissage Méditerranéenne (TFM)

### Company overview

TFM is a company specialized in textile dyeing and finishing. Its business field covers bleaching, dyeing and finishing. The company exports 70% of its production. Over the year 2010, it achieved an annual production of 6 million linear metres of fabric.

TFM has been among the first companies to implement the MED TEST project in order to improve productivity, resource efficiency and waste minimization, and ultimately to reduce waste treatment costs.

At project start-up, the company had no certified management system but it is now certified Oeko-Tex standard 100 and is setting up an ISO 14001-based environmental management system.

### Benefits

The MED TEST project has identified improvement options worth \$US 491,860 of annual savings in electricity, gas, water and chemical products, against an investment estimated at \$US 1,264,645. The pay-back period varies between 6 months and 5 years.

Energy costs have been reduced by 10% thanks to the implementation of heat exchangers in the mercerizing and washing units, to the thermal isolation of steam conducts, to the installation of special regulators on the PTZ gas hubs (because it depends on gas pressure, on the temperature and nature of the gas used) and by the installation of economic bulbs for lighting.

The cost of water will decrease by 56% thanks to the installation of a treatment and recycling system for wastewater, which subsequently will be reused in the process at a rate of 80%. This project is in the study phase.



**“Our company needs assistance to gain control over its consumptions and therewith its production costs. The project fully matches our expectations.”**

M. MOTTA, Director General of TFM

The cost of chemical products will decrease by 25% through the installation of a system for recovering caustic soda at the mercerization stage.

Other environmental advantages have been achieved through improvement in the management of chemical products storage and handling, and optimization of use in lab works, leading to a substantial reduction in the pollution load of waste water. In addition, the implementation of Oeko-Tex standard 100 improved the choice of products based on their ecological merit.

Environmental management accounting has been taken up by the company; currently, department-specific means for the measurement of different process input will be installed, which in the near future will allow for real-time monitoring of consumptions and costs by centre of costs, as well as for data integration into the environmental management accounting system.

MED TEST is a UNIDO green industry initiative to promote sustainability and competitiveness in the private sector in Egypt, Morocco and Tunisia. TEST integrated approach includes tools like resource efficiency and cleaner production, environmental management system and accounting, cleaner technology transfer and CSR.

**Learn more about TEST approach at [www.unido.org](http://www.unido.org)**

MED TEST is sponsored by the Global Environment Facility, the Italian Government and the MedPartnership.

## Saving opportunities

Measure	Economic key figures			Resource savings per year	
	Savings [USD/yr]	Investment [USD]	PBP [yr]	Water, Chemicals	Energy [MWh]
Heat recovery at mercerizing unit	8 000	7 500	1		551
Caustic soda recovery in mercerizing unit	285 000	430 000	1.5	600 tons NaOH	
Insulation of steam pipe network	17 500	19 285	1.1		976
Treatment and reuse of wastewater	175 000	800 000	5	135 000 m <sup>3</sup> water	
Installation of regulators on the PTZ gas hub	3 930	5 000	1.3		197
Lightening, installation of energy-saving bulbs	2 430	2 860	1.2		88
<b>TOTAL</b>	<b>491 860</b>	<b>1 264 645</b>			<b>1 812</b>

**Heat recovery at mercerizing unit:** The energy recovery project consists in the installation of a heat exchanger at the machine exit in order to recover calories for fresh water feeding the machine. The annual water consumption is about 130,300 m<sup>3</sup>, the heat exchange occurs between 90°C discharged water and fresh water with an average temperature of 20°C. Therefore thermal gains amount to about 45 th/m<sup>3</sup>, implying a total annual gain of 551 MWh/year.

**Insulation of the steam pipe network:** The steam network generates losses over the exchange with fresh air and over the lack of thermal isolation of the pipes. The losses incurred due to the complete absence of isolation on the network in question amount to 5,71 Th/h. To eliminate these losses, the project is to install isolation so as to insulate the steam pipes against heat. The isolation material opted for is rockwool, to be covered with an aluminium casing produced on the premises. The energy gains will be of 976 MWh/year (about 7% of the thermal energy consumption).

**Lighting, installation of energy-saving bulbs:** The project is to widely introduce economical lighting over 36W neon tubes, providing an annual gain of 88 MWh/year.

**Caustic soda recovery in mercerizing unit:** In the mercerization block, TFM annually consumes about 800 tons of caustic soda. The system in question is based on an advanced technology for thermal separation of soda and water. This allows for the retrieval of soda with a lower concentration, to be reused in the mercerization cycle. The caustic soda retrieval system allows to save up to 600 tons/year.

**Treatment and reuse of wastewater:** TFM consumes water of an average of 650 m<sup>3</sup>/d. The objective is to reprocess used water until its quality enables its reuse in the process. The treatment process therefore includes three stages: physicochemical reprocessing, biological reprocessing and tertiary cleaning: a filter system. This project, which will allow for the reuse of 500 m<sup>3</sup>/d, is still at the design stage.

**Installation of regulators on the PTZ gas hub:** Fuelled with natural gas under a pressure of 20 bar over the national STEG network, TFM is equipped with a 4 bar counting hub. The installation of a PTZ-type debit regulator (pressure, temperature, nature of gas) allows for the regulation of the remedial factor related to the varying temperature, which represents gains worth 197 MWh/year.



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