



MED TEST Case Study

## FOOD sector — TUNISIA

# Oil and fat industry — General Industrial Food Corporation Slama (CSM - GIAS)

### Company overview

GIAS, one of the protagonists of the Tunisian economy, was founded in 1983. With a € 30 million annual turnover and some 500 employees, the company manages innovative and top brands, producing about 50 different products (margarine, ingredients for pastry shops or bakeries). The company has signed a partnership deal with CSM, the world market leader and top supplier for bakery products. This joint venture provides GIAS access to a wide distribution network throughout a large number of countries.

The company's incentive for joining the MED TEST project was to identify new ways of reducing energy consumption, as well as material losses in each production site.

Before the MED TEST project started, the company already had an integrated management system for safety, quality and environment in conformity with ISO 9001, ISO 22000, ISO 14001 and OHSAS 18001 standards.

### Benefits

The MED TEST project has identified opportunities for annual savings of \$US 137,700 in raw materials, semi-finished products, water, electricity and steam, against an overall investment of \$US 191,200. The payback period is estimated at 1.2 years. Most identified projects have been implemented in 2011.

Optimizing the cleaning in place (CIP) process has reduced water costs by 12%, mostly through the replacement of chemicals previously utilized with one single-phase ecological product at the margarine production site GIAS 1. Energy costs have been reduced by 17% through the implementation of an action plan based on a diagnostic review of steam and compressed air leaks, as well as in NH<sub>3</sub> chillers and CIP optimization.

**“The MED TEST method links up with the sustainable development axis of the 2015 Strategy adopted by CSM–GIAS. Intent on being a ‘green company’, CSM–GIAS has initiated a company culture based on cleaner production.”**

Zouhaier SAOUDI, Operational Director

Further environmental benefits have been achieved in terms of reduction of wastewater pollution, corresponding to 93% of annual COD (Chemical Oxygen Demand < 500 mgO<sub>2</sub>/L), through the implementation of three projects which have allowed for a better recovery of product losses in production (215 tons), an improved quality control of water flows entering the wastewater plant and a rigorous follow-up on the wastewater plant performance.

CSM-GIAS's integrated management system has been reinforced during the implementation of the project. Indeed, the quality policy has been updated to adopt a CP strategy. Certain procedures and instructions have also been created and/or updated; an example is the creation of a working instruction for the analysis of oil and grease contents in the wastewater stream. In addition, the OHSAS 18001 system has been updated to include new projects aiming at the improvement of operators' health and working conditions (for instance, local fume hoods for mixing powders, GIAS 35/5 planned for 2012).

The company, which has benefitted from skills training in Environmental Management Accounting, has been able to determine and implement several measures allowing for a 2.5% reduction of raw material losses in production site GIAS 4, formerly identified as the main cost centre. The company has adopted EMA practices and implemented a system for weekly follow-ups in each production site.

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]
Product losses	25 000	-	-	120 tons products	
Optimization of CIP, GIAS1	11 200	7 700	0.7	2,300 m <sup>3</sup> water	50
Optimization of wastewater treatment	14 000	28 000	2		-
Preventive maintenance	10 500	3 500	0.3	1,000 m <sup>3</sup> water	830
Optimization of NH <sub>3</sub> chillers	70 000	138 000	1.9	95 tons product 700 m <sup>3</sup> water	632
Sustainable design of new cold storage at GIAS 2	7 000	14 000	2		100
<b>TOTAL</b>	<b>137 700</b>	<b>191 200</b>	<b>1.4</b>		<b>1 612</b>

**Product losses:** CSM-GIAS has adopted a method for reducing product loss in different production sites, mainly in the topping and icing site GIAS 4. This measure has allowed for the recovery of 33% of products lost during production starts and for their reintegration into the process, which has consequently reduced COD charges by 28%, an achievement in compliance with the national water discharge regulations.

**CIP optimization at GIAS1:** After obtaining satisfying results during one month testing of a single-phase product for CIP of the pasteurizer, chemical cleaning products used at GIAS1 have been replaced; which has allowed for water savings worth 12% of the total volume of water consumption in the company. COD charge and electricity consumption were reduced respectively by 7% and 1%.

**Wastewater treatment optimization:** Equipment purchases have allowed for very satisfying results (DCO < 500 mg O<sub>2</sub>/L), bringing sewage treatment into compliance with national wastewater regulations and reducing COD by 57%.

**Preventive maintenance:** The implementation of the action plan has contributed to a 3% reduction in the overall water consumption, a 10% reduction in thermal energy and 4.2% in electricity. The achieved financial gains have an immediate payback period (<1 month). Currently, a leak inspection programme is included in the weekly maintenance schedules.

**NH<sub>3</sub> chillers optimization:** The acquisition of a new compressor with variable speed drivers and an evaporative condenser has facilitated the optimization of the NH<sub>3</sub>-based cooling circuit for margarine crystallization, which has reduced inactivity periods due to low temperatures, thereby facilitating the recovery of 95 tons of product losses, the decrease of electricity consumption by 632 MW/year, corresponding to 12% of total electricity consumption, as well as 2% savings in water.

**Sustainable design of new cold storage (GIAS 2):** This project is a reference case for the application of CP principles when investments are at planning stage. The revision of the initial project design for a new cold storage room has highlighted the opportunity of moving the evaporators originally situated at the two ends of site GIAS 2 to the site's corridor, so as to facilitate the homogeneous circulation of cold air. As a consequence, the energy demand of the new cold group should decrease by 5%.



**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION**  
Environmental Management Branch  
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria  
Telephone: (+43-1) 26026-0, Fax: (+43-1) 26926-69  
E-mail: [unido@unido.org](mailto:unido@unido.org), Internet: [www.unido.org](http://www.unido.org)



**CENTRE TECHNIQUE DE L'AGROALIMENTAIRE (CTAA)**  
12, Rue de l'usine - ZI Charguia II - 2035 Ariana, Tunisia  
Telephone: (+216) 71 94 00 81, Fax: (+216) 71 94 10 80  
E-mail: [CTAA@topnet.tn](mailto:CTAA@topnet.tn), Web: [www.ctaa.com.tn](http://www.ctaa.com.tn)

