



MED TEST Case Study

## CERAMIC sector — MOROCCO

# Ceramic manufacturing industry — Ghorghiz Cerame Company

### Company overview

Ghorghiz Cerame is an industrial unit, located in the industrial area of Oued Laou in Tetouan. It has as its main activity the production of ceramic tiles of various designs and patterns. The company was established in 2003, employs 205 people and has an average turnover of \$US 8 million.

The company joined the MED TEST project in order to identify opportunities for effective use of resources (heat, water, electricity and chemicals), reducing production costs, recovery of solid waste and minimization of wastewater.

The company was certified ISO 9001 in 2008, the product is certified with the Moroccan norm NM, and the medium term plan is to obtain ISO 14001 certification.

### Benefits

The actions identified through the MED TEST project will enable the company to achieve annual saving of \$US 433,180 from the economy of energy, raw materials and chemicals with an estimated investment of \$US 347,583, and a payback period of 9 months. Half of the actions were carried out in 2011; the rest are scheduled for 2012.

The economic savings due the optimization of electrical systems, furnaces and gas systems represent a cost reduction in the annual energy bill of 4%. The most significant part of these savings is in the thermal energy, with the heat recovery project from the flue gas of the cooking furnace and from the atomisation tower. Besides energy savings, these measures will entail increase of productivity and product quality.



**“While receiving MED TEST technical assistance, we have realised how important environmental protection is, and how this can also help the company to improve its overall performance.”**

Redouane MERROUNI, Director General

All the effluents are recycled on site, as the residues of enamels and dyes are recovered and recycled within the process. The company has implemented several best practice to better manage the solid waste (cardboard, plastic and scrap metal) and their valorization through the recycling chain.

In addition to the savings opportunities, the company also benefited from technical assistance in the introduction of an environmental management system, which integrated both environmental policy and operational procedures. The company is already certified ISO 9001, and in the medium term plan to obtain ISO 14001 certification.

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]
Electrical system, compressed air, chillers	153 620	64 875	0.4		653
Furnaces and gas system	144 260	179 583	1.2		723
Waste valorization, effluent recycling	41 800	3 125	0.3	Water: 30 000 m <sup>3</sup> Various waste	
Heat recovery	93 500	100 000	1.1		731
<b>TOTAL</b>	<b>433 180</b>	<b>347 583</b>	<b>0.8</b>		<b>2 107</b>

**Electrical systems, compressed air, chillers:** The Company has put in place a set of actions to reduce electricity consumption, including:

Improving the power factor and subscribed power, installation of electricity sub meters, and installation of variable speed drivers on the air compressor.

The company plans to set up an on line monitoring system for energy consumption as well as variable speed drivers at the grinders. The company has replaced the chillers serving the production line n°2 with a cooling tower in order to reduce the electrical consumption: this action will be replicated on the production line n°1.

**Furnaces and gas system:** The company has insulated the cooking furnace using ceramic fibres, and has adjusted the burners to the optimum by adjusting the fuel pipe feeding the burner of the spraying tower. The company is planning to install a new generation burner with an injection system to optimize the fuel consumption at the atomiser and to implement a management system online to control the gas consumption. All these actions will generate a potential energy saving of 723 MWh/year.

**Waste valorization and recycling of effluent:**

- The grinding balls and alumina tubes of the furnace are currently being recovered, crushed and recycled; a certain percentage of this material is used within the product formulation
- Cardboard waste, plastic, wood and scraps are separated, baled and sold to recycling industries
- Dyes and enamels residues are recovered, filtered and reused in the first treatment layer of tiles
- The entire effluent generated is collected in a decantation pit, filtered, and reused in the preparation of the ceramic slip

**Heat recovery:** Two projects for energy recovery from flue gas have been identified:

- Installation of a heat exchanger to recover heat from the hot air of the atomization tower, to then preheat the inlet air to the furnace burner, raising the air temperature from 60 to 200°C.
- Energy recovery from the cooking furnace into the drying furnace. The gain represents 50% of current consumption of the drying furnace in addition to an increase in productivity

These actions have been implemented on the new production line recently installed in the company.



**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, Internet: www.unido.org



**CENTRE MAROCAIN DE PRODUCTION PROPRE (CMPP)**  
23 Boulevard Mohamed Abdou, Quartier Palmiers, Casablanca, Morocco  
Telephone: (+212) 5 22 99 70 53, Fax: (+212) 5 2 29 815 31  
Email: cmpp@cmpp.ma, Web: www.cmpp.ma

