



MED TEST Case Study

CERAMIC sector - MOROCCO

Ceramic manufacturing industry - CERAMICA OUADRAS Company

Company overview:

CERAMIC OUADRAS is a large industrial unit in the ceramics sector located in the industrial area of Khemiss Anajra (Tetouan), specializing in the manufacture of ceramic tiles of various designs and patterns. The company was established in 1991 with a capital of \$US 15 million, employs 300 people, and has an average turnover of \$US 17 million. All production is for the local market.

The company joined the MED TEST project in order to identify opportunities for resource efficiency (thermal and electrical energy, water, and chemicals), reducing production costs, recovery of solid waste, and minimizing waste water.

The company is ISO 9001: 2000 certified, and the products are certified according to Moroccan norm NM.

Benefits

The actions identified through the MED TEST project will enable the company to achieve potential annual savings of \$US 848,829 through economising thermal and electrical energy, water, and raw material consumption, improvement of product's quality and reduced non-conformities. Investment needed was estimated to be \$US 460,000, resulting in a payback period of 6 months. More than 30 recommendations for improvement were made. More than half of these actions (67%) were implemented by the end of 2014; the remainder are scheduled for 2015.

The energy savings potential was 10% of the annual electricity bill, 14% of the LPG gas bill, and 7% of



the fuel bill. These savings will be achieved through improvement measures to electrical systems, insulating hot surfaces, and optimization of gas consumption in the different furnaces.

Heat recovery projects from hot flue gas furnaces 1 & 2 were also identified.

Several measures were proposed to improve environmental performance and efficiency in terms of resource consumption including:

- insulating outside material storage areas;
- changing the clays grinding system in the Molino;
- installing an automatic sorting and packaging machine that will improve productivity and quality control, and reduce packaging consumption.

For liquid waste, water parameter quality control was strengthened before recycling to ensure all waste water could be recycled. Glaze and colour residues were also recycled in the process.

For solid waste, the company implemented several good practice measures for improving waste management and valorisation in special recycling industries.

About MED TEST

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

Learn more about the TEST approach at www.unido.org

Company overview:

Option	Economic key figures			Resource savings per year	
	Savings [USD/yr]	Investment [USD/yr]	PBP [yr]	Water, chemicals	Energy [MWh]
Electrical system, compressed air	24 8294	34 118	0.1		7 644
Furnace and gas system	56 241	17 059	0.3		666
Process optimisation	264 118	218 235	0.8		751
Heat recovery	277 235	189 412	0.7		2 467
Chemical and waste management	2 941	1 176	0.4	10 t chemicals	
TOTAL	848 829	460 000	0.5		11 528

Electrical system, compressed air:

The project identified several measures for reducing electricity consumption including: optimization of subscribed power after power factor improvement, installation of electric sub-meters linked to an energy management system, and lighting optimization. For compressed air, improvements included fixing air leaks, and installing traps on the supply tanks outlets. These measures reduced annual energy consumption by 7,644 MWh.

Furnaces and gas system:

Several measures were identified including: ceramic fibre thermal insulation of the baking and glazing furnaces, and replacing the conventional glazing furnace burners with a new generation of more efficient burners to lower gas consumption. These measures reduced energy consumption by 666 MWh.

Process optimisation:

The project identified several optimisation solutions such as:

- change to clay grinding facility (Mouolino) using alumina;
- control of water quality parameters before recycling water back into the process;
- insulation of external raw material storage areas to prevent moisture problems;
- installation of a new automatic sorting and packing machine for tiles to improve productivity and quality and reduce packaging consumption

Heat recovery:

Two energy recovery projects for hot flue gas were identified:

- recovery of heat from n°2 backing furnace to heat incoming combustion air;
- recovery of heat from n°1 backing furnace to heat incoming combustion air.

These two projects reduced energy consumption by 2,467 MWh/year

Chemical and waste management:

For main chemicals (fillers, colorants, additives), the recommendation was made to improve weighing procedures to optimize the consumption of these products, which ultimately reduced pollution load.

For the waste management component, part of the waste generated in the production process was recycled, such as:

- mixer balls and furnace alumina tubes recovered, crushed and recycled with the product material;
- dye and glazing residue recovered, filtered and reused in the first layers of tile treatment;
- Liquid discharges fully recovered in a settling tank, filtered, and reused in slurry preparation.



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