

# Succeeding where others failed

## Heat recovery for Italian tiles

Italy is famous for its stylish and high-quality tiles, used in residential and commercial projects around the world. After a leading manufacturer approached Alfa Laval with their heat recovery challenges, a system utilizing a welded spiral heat exchanger proved a success where others had failed. The result was 5 GWh of energy and 2500 ton CO<sub>2</sub> saved per plant and year. In total they have 9 plants.

The challenge brought by the tile manufacturer concerned a crucial step in their production process: the drying of raw ceramic materials. The manufacturer uses a spray drying process, where a high-pressure nozzle sprays the wet ceramic mix into a hot air stream. Here, water and volatile organic compounds quickly evaporate from the tiny droplets, leaving dry ceramic particles which are collected for further processing.

To reduce the immense energy requirements of the drying process, the customer wanted to achieve energy-efficient preheating of the mix before spray drying. Previous attempts at energy recovery and reuse through heat exchangers had all failed, mainly due to the properties of the ceramic mix. In addition to being very abrasive, the mix is non-Newtonian, with irregular behaviour such as hardening under sudden pressure. This had led to rapid clogging and unstable performance in the heat exchangers.





Energy savings  
5 GWh



CO<sub>2</sub> emission savings  
2500 ton



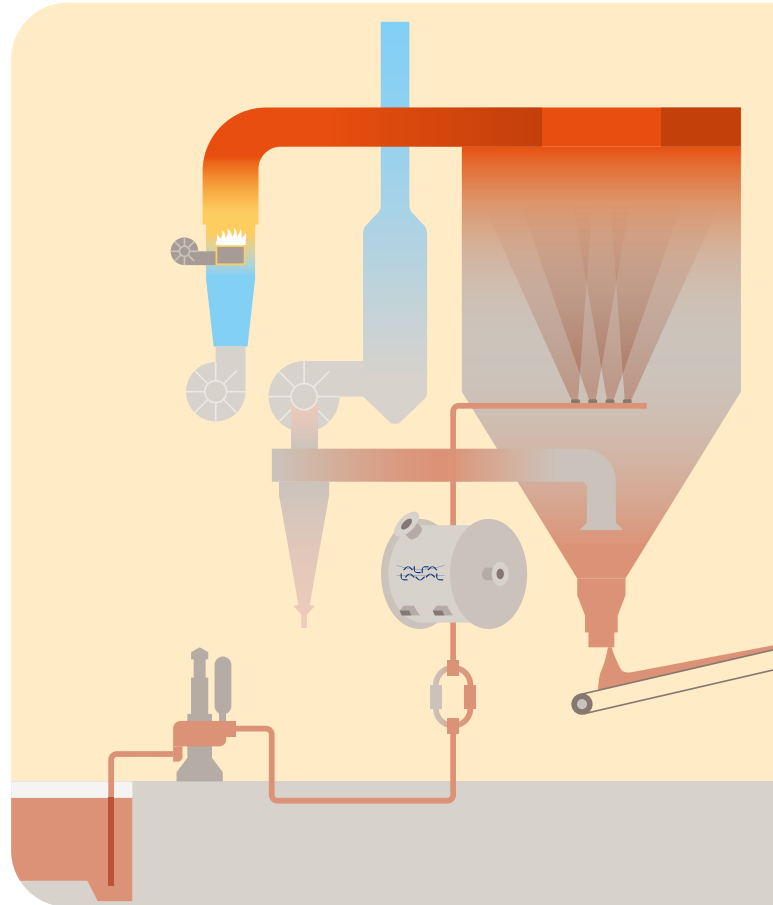
OPEX savings  
220,000 EUR

**Testing for success**

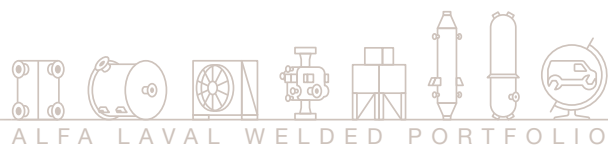
To meet the requirements for tough, stable, and efficient performance, the Alfa Laval team conducted a series of lab tests with the ceramic mix. After discussing their findings with the customer, a full-scale pilot using an Alfa Laval spiral heat exchanger was set up in one of the production plants.

The heavy-duty, welded spiral heat exchanger was placed before the inlet to the spray dryer. Waste heat from engines in the plant was fed to the heat exchanger to preheat the flowing ceramic mix. This process enabled a significant reduction of the furnace load to the gas-heated air stream, as less heat was needed to dry the already pre-heated mix.

The pilot proved a complete success, and the customer installed the heat-recovering preheating system in all their main production plants. Each plant now saves roughly 5 GWh every year through heat reuse, with a 2500 ton cut in yearly CO<sub>2</sub> emissions.



**Learn more about Alfa Laval Spirals**  
[www.alfalaval.com/spirals](http://www.alfalaval.com/spirals)



**How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)

100017192-1-EN 2312