

”A Tank full of Sun”

DURFERRIT GmbH supplies key components for the largest solar power plant in the world

In Andalusia, one of the sunniest regions in Europe, the largest solar power plant in the world is currently being built on the Guadix plateau. It will start normal operations in 2008. With a collector area of 510,000 square metres, the new power plant will achieve a performance of 50 megawatts.

It can supply up to 200,000 people with electricity from climate-friendly renewable solar energy. With a patented mixing/melting system for heat transfer salt, DURFERRIT GmbH, Mannheim, is making an important contribution towards storing excess daytime solar energy.

An important step before completion will be the filling of the large storage tanks with salt melt as a heat storage medium. This task, which is extremely demanding both technically and logistically, will be taken over by the company Haifa Chemicals, Israel, in collaboration with the company SQM, Chile, and the Mannheim plant construction specialist DURFERRIT. With the accumulated energy, steam generators are run during the night which provide the steam to generate electricity.

High melting performance in the shortest time

The company specialising in the construction of heat treatment systems for mechanical components and tools has decades of experience with salt melting. With DURFERRIT salt bath technology all types of components are heat or surface treated in special liquid salts at temperatures of up to 1.300 °C. The particular challenge with the Andasol plant is to melt vast amounts of salt in the shortest time and to heat it to around 400 °C. In order to have enough storage liquid available to absorb energy, around 30,000 ton-

nes of salt melt are needed for a special heat storage mix. DURFERRIT has built a salt melt production facility on site whose centrepiece is a special high-performance melting furnace.

Downtimes in a 310 € million project are very expensive: “Within 100 days our system has to produce and melt this quantity. We have designed the system so that the salt mix is continuously melted and then fed through special pumps into the storage tanks.”

Control technology crucial

In order to ‘feed’ the melting furnace with a diameter of around 4 metres and a height of 5 metres, every day 13 trucks of raw material from Almeria are required. A buffer store on site with 3.000 tonnes of salt also protects against unplanned

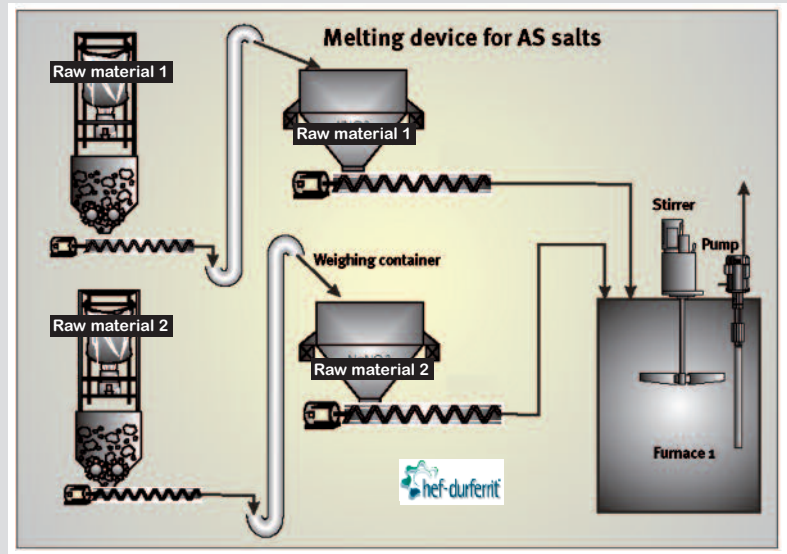


The melting furnace under construction with the two liquid salt tanks which serve as heat storage.

delays in delivery. 12 high-performance burners in the furnace melt down the salt using a specially designed stirring unit with such a high transfer of heat, that raw material can be fed permanently via dosing screws and at the same time salt melt at 400 °C can be pumped out. "We have both in the development of the furnace and the whole control technology benefited from our decades of experience in constructing salt bath systems. This also includes us having placed the furnace directly on a weighing machine in order to have the in and outflow under constant control."

At night electricity is generated with stored energy

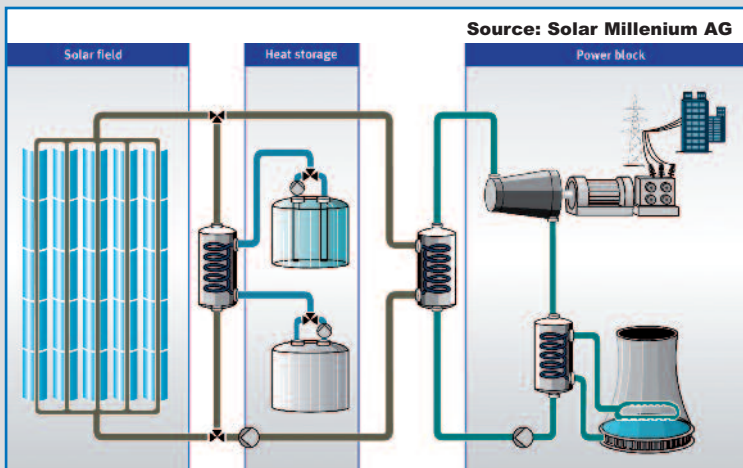
After the system has started operation the salt is heated up during the day – in addition to the normal generation of electricity – to around 400 °C. Heat is then taken from the storage tanks during the hours without sunlight and fed into a steam generator. The salt melt which as a result is cooled to around 300 °C is heated again to 400 °C during the hours with sunlight.



Durferrit melt concept for high output

This opens up a new business segment for the future for DURFERRIT, for the future prospects for solar thermal systems are considered to be extremely positive. Rising energy prices ensure that competitiveness with fossil fuels, in particular for generating electricity in the peak and medium-load range, will be achieved in the short term. As well as the almost completed Andasol 1 project the construction

of Andasol 2 has already started. This system is to go on line in 2009. The preparatory work for Andasol 3 has already started. "As the solar thermal projects in Spain show, DURFERRIT's experts succeed with their know-how in contributing towards developing new and innovative areas of application for salt bath technology time and again."



The heat storage in the salt bath enables the 24-hour supply of electricity.

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