Great Energy Savings with SUPERTHAL in Feeder Forehearths

Walther-Glas in Germany is one of many companies utilizing SUPERTHAL flat panels in their forehearths and they have also followed up the results in a systematic way.

Walther-Glas GmbH in Bad Driburg produces mainly domestic and all-purpose glassware by the pressing method for the gift sector, as well as pressed glass articles for the car industry. In order to retain its position as a market leader in the future, it has established as part of its company policy the constant introduction of innovative production techniques.

Domestic or all-purpose glassware accounts for around 90 % of turnover. Of this, about 60 % goes on exports. The remaining is composed of supplies to the car industry, such as diffusing screens for headlights. Around 50 models of cars are fitted with this product. The glass type is normally 70 % SiO_2, 10 % CaO and 19 % Na_2O/K_2O.

First SUPERTHAL in 1992 – 40 % Energy Savings

Walther-Glas uses three production tanks each with a capacity of 24 – 30 tons day. The batch preparation takes place according to special recipes under process control and thus meets one of the main requirements for unvaried glass quality.

The forehearths conveys the molten glass at a temperature of 1450°C (2640°F) to the processing machinery. At Walther-Glas this consists of four sliding tables and twelve circular table presses. Temperatures of around 1150°C (2100°F) are still required in the processing area.

One of the three forehearths at Walther-Glas.

The distribution system thus exerts a critical function and also has an important influence on the energy consumption. A new technique has therefore been developed jointly with Kanthal.

The forehearth channel system of melting tank 2 was reconstructed in 1992 for use of SUPERTHAL heating modules. The rebuilding was done in just 3 days. The heating area is now reduced by a clear 55 % compared with conventional heating by vertically installed KANTHAL® Super elements. An inner cross-section of 100 x 424 mm (3.9 x 16.7 in) is now sufficient, whereas 250 x 400 mm (9.8 x 15.7 in) were required previously. The lifetime of the first feeder was about 3 years and it was relined in January 1995, also using SUPERTHAL flat panels.

Forehearth system melter 1 was reconstructed for flat panels 1993 and relined 1996 and the new melter 3 system was commissioned early 1995.

There are clear effects on the energy consumption. Previously approx. 63 000 kWh a month were required on average and now the consumption is reduced 40 % with SUPERTHAL heating modules to approx. 38 000 kWh. This results, for a tank cycle of about three years, to direct energy cost savings of between DM 84 000 to 105 000. This is combined with smaller energy production rises, since the installed power and the peak values of the power consumption are correspondingly reduced.

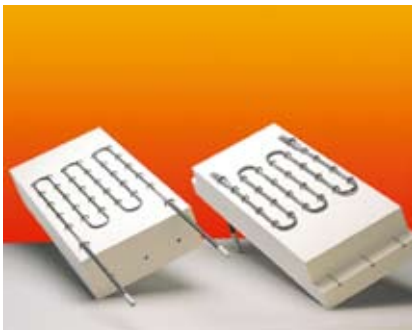
Pay-Off Time of 15 Months

Current experience at Walther-Glas shows that the investment has already paid for itself after 15 months. The energy savings have a net effect from this time onward. In contrast to conventional solutions, a change of the heating elements is also rarely needed, which once again enables savings to be made.

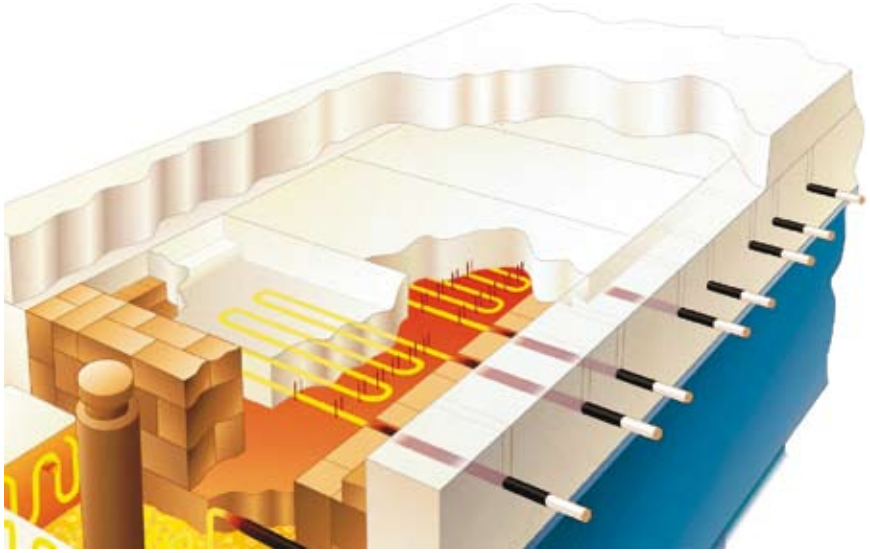
As regards the improvement of the working conditions, the ambient temperature of the forehearths is far lower. Whereas before the surface temperature was about 90°C, (195°F) it is now only 50°C (120°F). The positive effect of the significantly smaller radiation area is an added factor. The smaller heat load in this area improves the working conditions considerably.

In conclusion, Walther-Glas rates the advantages of the new technology as follows:

The direct energy savings come first, followed by savings through simpler and shorter assembly time and finally lower installed power and the improved working conditions.



SUPERTHAL flat panel rated at 5 kW is used in all three forehearths. The panels are customized in length and width.



Installation of SUPERTHAL flat panels is done in just a couple of days with a minimum of production downtime.

Technical Data

Heating modules	
Type	SUPERTHAL
Size	l=675 mm, w=300 mm, h=125 mm (26.6 in, 11.8 in, 4.9 in)
Heating element	KANTHAL Super
Material	Molybdenum disilicide/$MoSi_2$
Position	Horizontal
Insulation	Aluminum silicate F14
Temperature, max.	1400°C (2550°F)
Installed power	175 kW
Number of modules	38–42
Forehearth channel	
Refractory bricks	ZAC 1681
External insulation	FIBROTHAL® F3
Cross-section	178 x 406 mm (7 x 16 in)
External dimensions	382 x 924 mm (15 x 36.3 in)

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