

Tomorrow's Technology Today

Electric furnaces

FIC has, almost certainly, a far more extensive corporate knowledge of electric furnaces than any other company in this field. It can offer clients all the advantages of these furnaces, ideal for more volatile glasses, with none of the traditional disadvantages.

As well as the company's origins lying in electro-heat and specifically electric furnaces, a sizeable proportion of the FIC workforce has gained considerable expertise and experience working for glass-makers with all-electric furnaces prior to joining the company. Added to this is FIC's much-lauded and internationally recognized reputation for technological innovation.

One of the known disadvantages of electric furnaces is a poor turn-down ratio. FIC's highly advanced solution to this is its unique Fully Modulating Electric Furnace embodying a flexibility of operation that allows zero to maximum design pull without detriment to glass quality.

FIC has provided medium to large scale furnaces to a number of clients world-wide. Equally its range, which includes laboratory-scale furnaces and those of all shapes and depths, affords capacities from a few kilograms to 200 tonnes per day. All benefit from FIC's carefully selected design details based on unmatched experience and appreciation of glass convection current flow in the furnace and unlimited support by our team of experts and consultants.

Uniquely, FIC can ensure complete stability of composition in the high-tech formation of PDP and LCD glass. In these glasses the company offers well proven electrode solutions rather than expensive and unproven precious metal.

The FIC Maxi 'Q' No-Weld Electrode Holder is ideal for the more aggressive glasses. It is particularly forgiving and resilient with no critical weld inside of the refractory blocks.

With the advantage of low capital cost and 24 hours re-build and warm-up periods, Pochet furnaces are ideal for those subject to the vagaries



of a volatile market where stop/start may be an operational feature.

FIC's innovative technology allows Pochet furnaces to be used for the melting of Basalt. Other specialist applications include rolled sheet and coloured glass.

- Design and Build
- **Electric Furnaces**
- Electro Boost
- High Q Holders
- Electrode Holders
- HVP Forehearth
- Iso-Thermal Unit
- Bubbler Systems
- Electrode Maintenance Unit
- Drains
- Mathematical Modelling
- Engineering Services



**The World's
Number One
in Furnace Technology**



FIC: all the advantages of Electric Furnaces without the disadvantages

■ Possibly more technological innovation and experience than any other company in this field

■ Ideal for the volatile glasses where quality is so important

■ Excellent turn-down ratio

■ Unique flexibility of operation

■ Near perfect melting conditions

■ Furnaces of all depths, shapes and capacities

■ Batch chargers to suit all requirements

■ World's most advanced electrode holders

■ Furnaces for glass craftsmen

■ Maximum warm-up heat retention with FIC Furnace Roofs and Superstructures

■ Unique PDP/LCD factoring

■ Full range of Pochet Furnaces

■ Temporary Combustion Systems for emergency use

■ Laboratory scale furnaces

■ Environmentally friendly



Only the World's No. 1 technological innovator, with the most experienced staff in this field, can bring you all the advantages of electric furnaces with none of the disadvantages.

Electric Furnaces have long been acknowledged as ideal for the more difficult glasses such as the various forms of Borosilicate glass, including Neutral Borosilicate used in the pharmaceutical industry, Pyrex with its low expansion, Fibre glasses, Opal Borosilicates for ovenware and Opal Soda for tableware as well as the PDP and LCD glasses.

Offering an extensive range of electric furnaces of varying depths, shapes and capacities, which range from 200 tonnes to a few kilograms a day, FIC has



drawn on its extensive experience and reputation for always challenging the accepted barriers of technology to provide a number of different types of furnaces to clients world-wide.

FIC can provide Laboratory scale furnaces from those for lead crystal, opal and glass melts to enable companies to carry out evaluations of different glasses. It also provides a range of furnaces for glass craftsmen. Electric furnaces have the advantage of being less noisy and more thermally efficient and thus environmentally friendly.



- Design and Build
- Electric Furnaces
- Electro Boost
- High Q Holders
- Electrode Holders
- HVP Forehearth
- Iso-Thermal Unit
- Bubbler Systems
- Electrode Maintenance Unit
- Drains
- Mathematical Modelling
- Engineering Services

dvantages

FIC can always be relied on to come up with an innovative answer to the problems that traditionally beset the industry. FIC's FULLY MODULATING ELECTRIC FURNACE overcomes the problem of a poor turn-down ratio. Whilst most electric furnaces are usually unable to go from zero to the design pull at



will, FIC has adapted its comprehensive in-depth forehearth sealing technology to create a unique, sealed, electric furnace with hot-top which allows a flexibility of operation never before available in an electric furnace. Idling a traditional cold-top electric furnace will cause blanket melt-out.

The exceptional quality of the composition control over the full range of furnace output allows for near-perfect melting conditions and the elimination of seed and bubble as well as making sure that the volatile components are not lost from the glass melt.

FIC's unique throat and riser design ensures that glass quality continues to improve and the provision of a sealed pre-refiner makes certain that glass of a suitable quality is delivered to a platinum refiner and stirrer cell and hence to the manufacturing process.

Much more cost-effective to build than the traditional furnace, the FIC'S FULLY MODULATING ELECTRIC FURNACE requires no intrinsic superstructure, regenerators to aid heat recovery, electrostatic precipitators or other inherently expensive devices to clean up exhaust gasses that would be necessary with a fossil-fuelled furnace. Regenerators can account for half the cost of the furnace.

Raw material costs can be up to 20% lower than other designs with the recycling of the volatile components by condensing in the batch blanket. The application of direct heat contributes greatly to the superior quality of the glass produced by this method.

The FIC FULLY MODULATING ELECTRIC FURNACE is particularly suitable for PDP and LCD glasses where a very high degree of process control and stability of composition are required if forming characteristics are to remain constant. With a panel surface flatness with less than 50 microns, minor composition changes are a significant factor.

Of necessity, inherent in the process are the large amounts of time when the process is stopped. FIC is the only company to factor in this very significant element of electric furnace operation.

Once again FIC's innovation overcomes the restrictions of traditional dogmatism in the provision of electrodes for PDP and LCD glasses.

Typically the industry uses platinum electrodes. Whilst occasionally these have their use, FIC's experience and pioneering philosophy have enabled it to supply systems with more conventional electrodes, using molybdenum for the Borosilicate and Opal glasses and tin oxide electrodes for lead crystal glass.



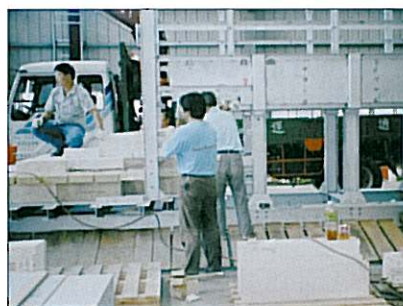
Ideal for the more 'difficult', 'aggressive' glasses is FIC's unique Maxi 'Q' No-Weld Electrode Holder. It is the only holder which has been field-proven as being capable of insertion through the batch-blanket, through the partially melted batch and into the glass for effective sealing of the electrode thereby eliminating the typical problems of electrode breakage that are common with electrodes from the top. It has no weld inside of the furnace refractory blocks with the result that there can be no leakage of water into the furnace itself in the case of inevitable wear to the furnace refractories.

FIC supplies XY Batch Chargers as well as simpler systems such as that based on the principle of mechanical spreading from a central source. All are tailored to suit customers' specific requirements.

The warm-up period being critical, FIC can supply a range of both integral and lightweight removable roofs and superstructures for electric furnaces so that maximum heat is contained and the most expedient warm-up is effected.

We can supply Combustion Systems to facilitate warm-up and for emergency use. These can, if necessary, be built into the furnace superstructure.

With low capital outlay, warm-up and rebuild periods of 24 hours and the facility for being able to be switched on and off at will, FIC's range of POCHET furnaces are not only traditionally used in the fibreglass industry but can also produce a very high quality of glass in combination with downstream refining techniques and are ideally suited to volatile market conditions where production



requirements may fluctuate considerably. Innovative technology allows them to be used for the melting of Basalt and a range of specialist applications including the production of rolled sheet and coloured glass.



The World's Number One

F.I.C. (UK) LIMITED

FIC (UK) Limited
Long Rock Industrial Estate
Penzance
Cornwall TR20 8HX
United Kingdom

Tel +44 (0) 1736 366 962
Fax +44 (0) 1736 351 198
Email general@fic-uk.com
Web www.fic-uk.com

Part of the BMT Group of Companies

- Design and Build
- Electric Furnaces
- Electro Boost
- High Q Holders
- Electrode Holders
- HVP Forehearth
- Iso-Thermal Unit
- Bubbler Systems
- Electrode Maintenance Unit
- Drains
- Mathematical Modelling
- Engineering Services

