

# Tomorrow's Technology Today

## World leaders in furnace technology

Nobody else has the insight and in-depth knowledge of the glass manufacturing industry to be able to satisfy every customer need.

- *Complete glass manufacturing plants.*
- *Regenerative Furnaces.*
- *Recuperative Furnaces.*
- *OxyFuel Furnaces.*
- *All electric Furnaces.*
- *Project management.*
- *Engineering.*
- *Technology.*
- *Construction services.*
- *Mathematical modelling for the ultimate in customized design.*
- *Environmental control.*
- *From batch plant design through cold-end operations.*

FIC's constant questioning of the industry's status quo and its ability to advance industry technology in such a way that it is now recognised internationally as leading the way in development, enables it to bring a wealth of unparalleled experience, insight and expertise to any requirement a customer may have. Responding to the requests of many of our delighted clients world-wide, we have recently expanded our range of services to include the design and build of any type of furnace, of whatever capacity, for all types of glass.

Through our strategic partnerships we are able to offer a complete range of services from troubleshooting and small design improvements to complete 'Turn-key' solutions.

### ● 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**



# World leaders in furnace technology

## Experts for every aspect of furnace technology

FIC, the very first company in the industry to be accredited with ISO9001, is able to call on the specialisms of over 200 industry experts world-wide to undertake 'Turn-key' projects from the design stage through to furnace heat-up and commissioning procedures. In addition, we are able to carry out projects in the construction of industrial furnaces, industrial halls as well as general construction work.

FIC and its partners have a team of furnace and installation designers as well as a process and operation branch where engineers and technicians, experienced in the starting up of furnaces and optimizing their performance, regularly carry out research on melting techniques, furnace operation systems and automatic control systems.

FIC's construction and assembly team is made up of 90 skilled and experienced bricklayers and fitters for all furnaces.

We can design regenerative and recuperative glass furnaces, both cross-fired and end-fired, as well as oxy fuel furnaces and other industrial furnaces.

FIC can construct a variety of glass furnaces equipped with measuring and control systems which reduce the emission of  $\text{NO}_x$  to 1000  $\text{mg}/\text{Nm}^3$  of waste gases. Furnaces built to specifications and design with the aid of our unique mathematical modelling ensure a high melting capacity, low energy consumption and a high daily pull.

## Diagnosis and repair

FIC can carry out inspections and technical evaluations of glass furnaces with the application of a digital thermo-vision system enabling visual access to the most inaccessible parts of the furnace.

We carry out both preventative works and hot repairs such as fused-cast and clay-flux overcoating and the correction of rat holes in side walls and the crown.

The repair of glass melters is an integral process and starts with furnace drainage through controlled cool-down and the demolition of used fused-cast materials. This is followed by construction, brick-laying and fitting works, through to controlled heat-up, the monitoring of stress on the furnace steelwork, the adjustment of crown-rise and pre-heated cullet charging. FIC guarantees an optimal technological level at minimal energy consumption.

### ● 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



### Heat-up, charging and controlled cool-down of furnaces

Another specialisation offered by FIC through its partners is the heating up of glass furnaces through the application of modern, fully automated and safe heating units which help maintain a steady and uniform increase in both temperature and pressure levels throughout the furnace in accordance with technical procedures. Our specialist heat-up team carries out computer-aided monitoring of the crown-rise in chambers, in both melting and working end, and registers the outcomes of movements as well as the course of adjustments.



### Environmental protection

FIC can undertake environmental protection especially the evaluation and reduction of NO<sub>x</sub> emission.

### The supply of furnace combustion systems

We manufacture three types of energy saving burner nozzles for low, medium and high gas pressure. The introduction of the nozzles has been followed by a rational saving of 5-8% in gas consumption by the glass plants implementing them. Our new furnace combustion system helps achieve the specific energy consumption of 950 kcal/kg of glass and the emission of NO<sub>x</sub> below 1000 mg/Nm<sup>3</sup> of waste gasses. FIC also designs and produces burners for working ends as well as special application burners.

### Optimizing the thermal-technological parameters of furnaces

FIC and its partners will assess energy consumption indexes and work to optimise the thermal-technological parameters which influence unitary heat consumption in order to reduce it to a minimum using the very latest in high-quality measuring instrumentation.

### The supply of automatic control systems and control and measuring instrumentation

We are also able to design, deliver and assemble automatic control systems for glass melters, as well as control and measuring instrumentation from companies such as: Eurotherm, Siemens, Allen Bradley, Honeywell. Our systems are equipped with reliable actuators and measuring transmitters with guaranteed very high performance.

### Glass blister gas analysis

The chemical composition of gases in glass blisters is analysed using gas chromatography combined with mass spectrometry. We usually undertake the analysis of O<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub>, CO, SO<sub>2</sub> Ar and H<sub>2</sub>O but we are also able to analyse H<sub>2</sub>, H<sub>2</sub>S.

FIC will find the most likely source of the gas and advise the client of the most expedient solution.



- **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



**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](mailto:general@fic-uk.com)  
*Web* [www.fic-uk.com](http://www.fic-uk.com)

*Part of the BMT Group of Companies*