

Insulating Fiber Furnaces

GREATER GLASS QUALITY, INCREASED EFFICIENCY & IMPROVED OPERATING FLEXIBILITY



GLASS PLANTS
BATCH & CULLET SYSTEMS
GLASS FURNACES
EMISSION CONTROL
WORKING END & FOREHEARTH
PROJECT MANAGEMENT
INSTALLATION
REBUILDS



TECO

ENGINEERING THAT FITS YOUR EQUATION.

TECO: technology at work *Insulating*

TECO has been a vital part of the worldwide glass industry for over 75 years and has served the C-Glass (high-alkali borosilicate insulation/glass wool) sector for almost 60 years. TECO has designed and built a total of 55 furnaces for C-Glass applications; 43 cold-top electric, five recuperative and seven oxy-fuel.

Cold-Top Electric Furnaces – Pioneered by TECO

TECO pioneered the use of cold-top electric melting in conjunction with C-Glass. The patented TECO/Elemelt cold-top electric furnace, which operates on the Joule effect, is the industry standard for melting C-Glass. The furnace operates as a vertical melter and the batch cover serves as a good insulator, enabling the melter to operate in the 80% efficiency range. It is environmentally friendly and does not produce NO_x during the melting process. The emissions are a slight dusting from the batch transfer to the melter and off-gases from the melting process, which are predominately carbon dioxide (CO₂) and water vapor (H₂O). The dust emissions can be controlled simply by the use of a bag filter.

Recuperative Furnaces

TECO recuperative furnaces offer a carefully considered balance between refractory life, glass quality, flexibility of output and capital investment. Efficiency is achieved by the use of a heat recovery system incorporating either a single-stage or double-stage recuperator in conjunction with an appropriately designed insulation package. Bubbling and boosting are frequently incorporated to enhance both glass quality and output. Batch is fed into the furnace via a screw or pusher-type charging system installed on a sealed doghouse.

Environmental Considerations

C-Glass batch contains a number of volatile components, which lead to high levels of particulate materials in the exhaust gases. Some of these condense and are retained in the heat recovery or flue system, but many pass out of the system and can be collected by means of a suitable capture device. Since some of the emissions may be non-condensable acid gases, an alkaline reaction stage has to be incorporated to turn them into solid material. The capture device can be either a fabric filter or an electrostatic precipitator.

NO_x generation is minimized at the design stage by paying attention to details of the combustion system, the insulation level and the hot-sealing of the furnace.



Cold-top electric furnace melting C-Glass and performing at 273 metric tonnes/day (300 US tons/day) at an energy consumption of 775 kWh/metric tonne (703 kWh/US ton)



Recuperative furnace melting C-Glass and performing at 200 metric tonnes/day (220 US tons/day) at 1250 kcal/kg (4.5 MBTU/US ton)



Oxy-fuel furnace melting C-Glass and performing at 250 metric tonnes/day (275 US tons/day) at 850 kcal/kg (3.0 MBTU/US ton)

The Oxy-Fuel, Environment Friendly Furnace

Oxy-fuel furnaces are a natural way of avoiding pollution because they virtually eliminate nitrogen from the combustion process.

Depending on the requirements, a TECO oxy-fuel furnace can be provided to:

- Increase output
- Reduce NOx emissions
- Improve efficiency
- Improve glass quality
- Simplify furnace operation

TECO oxy-fuel furnaces are designed for long campaign life and high-quality glass production. Refractory selection is matched to campaign life and capital cost requirements. To ensure NOx is kept to a minimum, a sealed doghouse system incorporating screw-chargers is used. Bubbling and boosting are frequently utilized to enhance both glass quality and furnace output.

Distribution Channel & Bushing Forehearth for Ideal Forming

TECO offers electrically heated (Joule effect) or gas-fired distribution channels and bushing forehearths. The TECO forehearth system delivers molten glass to the bushings with minimum temperature variation top to bottom and side to side, thus maximizing production efficiency.

C-Glass has a relatively high boron and alkali content and is subject to significant volatilization which, as a condensate, aggressively attacks the channel and forehearth superstructure refractories. TECO's many years of experience in superstructure design and refractory selection assure that glass quality will be maintained and service life will be maximized.

Batch Plants

TECO batch plants and batch/cullet handling systems are designed as an integral part of the glass-making process. The quality of the mixed batch produced is commensurate with the glass quality requirements. TECO batch plants incorporate the latest in mechanical and pneumatic materials handling techniques and equipment. TECO batch plants are designed and constructed with provisions to increase raw material storage and mixed batch output, when required.



Distribution channel/forehearth system designed for 250 metric tonnes/day (275 US tons/day)



Batch plant for 680 metric tonnes/day (750 US tons/day) production and nominal storage of one (1) week per ingredient

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