Hotwork™

SERVICING THE WORLD of GLASS MAKING

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Hotwork™

World **Leaders** in Glass Furnace Services

Since 1965

Hotwork has provided refractory dryout and heatup expertise to a multitude of industries. With over 20,000 projects completed to date, we are the largest and most experienced dryout company in the world. Our equipment and personnel are strategically placed around the globe allowing us to respond to customer's needs no matter the location. Our field personnel are backed by a management team with an average experience of over 25 years. But we are more than experience. Hotwork prides itself on being a solution-oriented company utilizing cutting edge technology to deliver the best possible service.

"We are the **largest and most experienced** dryout company in the world."

Furnace Heatup

The campaign life of all glass furnaces can be greatly affected by the initial heatup process. Traditional heatup methods for these furnaces produce a relatively cold bottom, with higher temperatures in the superstructure and the crown. This non-uniform heating method results in temperature/expansion differentials between the furnace walls and crown. These differentials can cause cracking of new or old refractories and weaken the furnace structure which can ultimately result in shorter campaign life. Hotwork's unique high velocity heating system creates positive pressure and uniform temperatures within the furnace, while also providing precision temperature control from 200°F (93°C) to over 2500°F (1371°C). This combination creates optimal heating conditions within the furnace thus reducing the risk of damage to furnace refractories or structural steel during the heatup process.

Glass Draining

Hotwork has drained molten glass from furnaces since 1977. Over the last 40-plus years, Hotwork has revolutionized furnace draining by developing various techniques such as recirculated/recycled hot water drains and container drains. These methods allow for containment of hot water, reducing or eliminating the environmental impacts associated with discharge. With over 2,000 drains completed to date, Hotwork is well versed in your facilities' draining needs.

Rapid Steam Cooldown

Glass furnace repairs take time which means production losses. A cold repair means even more loss, partially due to the time it takes the furnace to cool. By utilizing specialized equipment, Hotwork can introduce vaporized water and large volumes of air into the furnace, in effect force cooling it. Even the largest furnaces can be cooled to ambient within 48 hours.

Controlled Cooldown

When portions of the furnace refractory need to be saved, Hotwork's controlled cooldown services are the answer. Hotwork will insert our high velocity heating systems into the furnace at which point the permanent furnace burners are turned off. Hotwork's burners are adjusted as needed to meet the cooling schedule.

Electronic Crown Monitoring

During the heatup or cooldown of a furnace, monitoring the rise or fall of the crown is a critical activity. The Hotwork Electronic Crown Rise Monitoring System places transducers on the furnace crown which are connected to a digital data recorder. These points are monitored during the furnace heating or cooling process and crown adjustments are made accordingly. This system is thought by many to be superior to traditional analog methods due to its increased safety and removal of potential human error when measuring.

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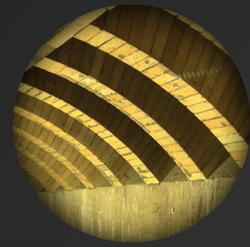
Cullet Filling and Options

Each glass production facility has its own specific goals and concerns when it comes to cullet filling. As a result, Hotwork has developed multiple cullet filling options.

- Blown Cullet - The fastest and most efficient filling method. Can be combined with cullet wetting and cullet screening to reduce introduction of fines into the furnace and minimize dusting of furnace superstructure.
- Vibratory Feeding - Slower than blowing cullet. Virtually eliminates dusting of superstructure.
- Cullet Wetting - Automated addition of minimal amounts of water to cullet to reduce dusting of superstructure when cullet is blown.
- Cullet Screening - Results in optimal cullet sizing for fill. Removes fines (percent of fines removed based on initial cullet quality) from cullet prior to introduction into furnace.

Furnace Expansion Control Supervision

A vital step in the heating or cooling of a glass furnace is the adjustment of the steel bracing which holds the furnace together. Incorrect adjustment can result in damage to important refractory components, and in severe cases cause glass leaks. Hotwork's technicians have extensive training and experience in expansion and contraction control for glass furnaces. Our personnel's knowledge of both furnace refractories and structural design is the foundation of this critical service.



Thermal Checker/Regenerator Cleaning or Sulfate Burn Out

No matter what you call it, blockage of furnace checkers or regenerators is a problem. It can increase fuel consumption and furnace pressure, damage refractories and reduce furnace pull rates. By introducing heat into the bottom of the regenerator, Hotwork 'melts' sulfate deposits within the chamber. As these deposits melt, they flow down the regenerator pack and onto the floor and are removed once solidified. The process is repeated for all regenerator areas that are plugged. This service can be performed while the furnace is under normal operating conditions. Let your furnace breathe again. Bring in Hotwork to clean your regenerators and checker packs.

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