

## Hotwork Keeps the Doors Closed

The range of the Hotwork system permits starting the dry-out less than 100°C with all doors closed and sealed.

With closed doors the thermocouples in both roof and floor follow a uniform schedule.

### Hotwork pressurizes a furnace

The unique Hotwork full fan output from the start of the dryout pressurizes a furnace and produces in the order of 23 air changes per hour. Ingression of cold air is prevented.

### Convective heating prevents hotspots

The floor, ramp and all the corners of the furnace are washed with hot air to remove moisture. No hot flame is visible.



Large aluminum furnace and holding furnace with Hotwork at work.



Hotwork does not extend temperature "hold" times for low pressure steam visible at the furnace shell. The steam that damages refractory is internal, invisible high pressure steam.



### Fuel savings pays for Hotwork services

A controlled Hotwork dryout of 4 - 5 days vs. traditional methods requiring 20+ days can generate substantial financial benefit in fuel costs and increased production time.

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# Hotwork Services to the World of Aluminum from Calciner to Furnace



Hotwork, founded in the 1960's



### Alumina Calcining

The modern alumina calciner is a system of refractory lined cyclones, furnaces, ash coolers and connecting lines.



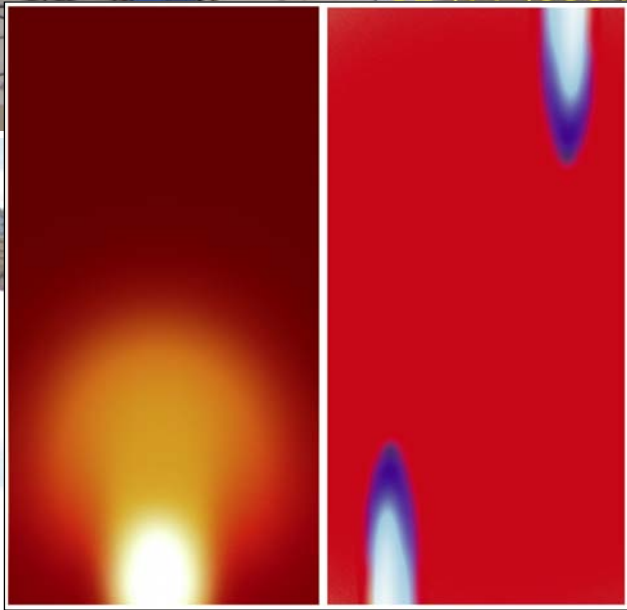
In operation hot abrasive material traveling at high velocity will quickly find flaws in a lining that hasn't been properly installed and dried.

Hotwork tailored the dryout process to alumina calciner systems in the late 1970's which is

now considered best practice in many alumina refineries worldwide.

To use natural heat flow in a large fluid bed system can cause cold spots in lift pots, cyclone

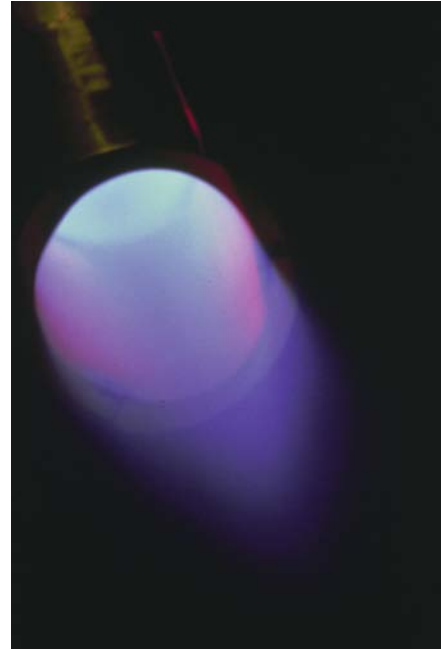
cones and j-bends. The Hotwork method uses multiple dryout systems and strategic placed bulkheads to insure uniformity through pressurization.



Conventional vs Hotwork heating method

The radiant flame is designed to transfer heat to a product.

The cold flame of the Hotwork system is ideal for drying material.



### This burner won't blow out

Many types of burners are used for dryouts, but the Hotwork system has the greatest energy range and can operate in both a positive or a negative atmosphere – this burner doesn't blow out with minimum fuel and maximum air volume!

### Fuel Flexibility

In addition to using a variety of gaseous fuels, Hotwork developed a new generation of pure diesel burners that burns clean, needs no gas or propane and only a small amount of atomizing air. We can supply tanks, pumps and hose for a complete service.

### Aluminum Furnace Service

Most furnace



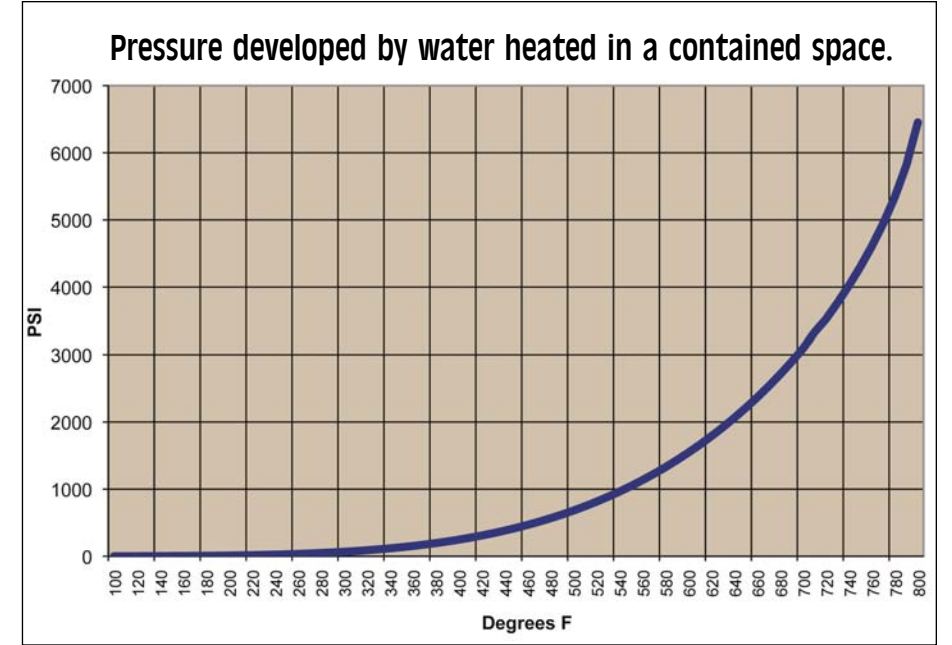
Damage from localized radiant heat. Breakage is thinner and of a smaller size.



Explosive damage occurs when high pressure steam can not escape, often at 425° C.



Steam pressure damage.



burners can't operate at the low temperature prescribed to start a castable refractory dryout. A common procedure is to partially open the door for the first several days.

This permits controlling roof temperature but expose the ramp and hearth to cold outside air drafted in through the open door.

When the door is closed later in the heatup – the hearth and ramp are flooded with heat and can sustain serious damage.

### Harmful negative pressure

If the stack or flue is not closed during the dryout cold out-

side air is drawn in around doors and wells. Temperature lacks uniformity and will not penetrate low corners where the greatest concentration of moisture exists.

### Gas torch dryout problems

A gas torch radiant flame creates several problems.  
\* Heat rises and overheats the roof while under-heating the floor and corners.

\* The refractory surface tends to bake and seal preventing moisture escape.

\* Humidity increases in the furnace.

### Air changes required

Radiant heat and low-firing furnace burners provide few air changes per burner. Refractory companies often specify a number of air changes per hour for effective moisture removal.