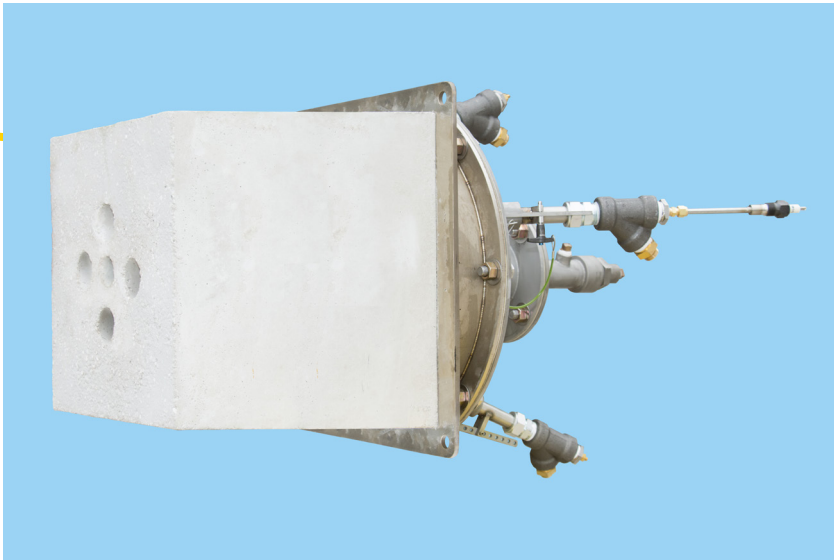


# Transient Heating oxy-fuel burner, featuring Smart Technology

## Improve productivity, fuel efficiency and yield in your reverb furnace



Reverb furnaces are inherently less efficient than rotary furnaces in transferring available energy to the metal. Turn to the Air Products Transient Heating burner for a unique heating option to help you improve productivity, fuel efficiency and yield—all of which can improve your bottom line.

Our patented Transient Heating oxy-fuel burner is the only smart burner technology in the world using a sensor-driven control strategy to direct heat down toward the melt, sequentially to all areas of your reverb furnace. This allows you to increase the overall heat transfer efficiency to provide more even heating throughout the furnace, eliminate cold zones, and maximize melt rates.

### Proven benefits

- Up to 40% increased productivity
- Up to 40% improved fuel efficiency
- Up to 20% reduction in yield losses



### How it works

In reverb furnaces, conventional air-fuel sidewall-fired and regen burners direct energy into open spaces within a furnace and radiate energy in all directions, which transfers heat directly to the melt and indirectly to the refractory. The rate of overall energy input is determined and limited by the maximum allowable surface temperature of the refractory.

In contrast, the Transient Heating burner is usually mounted on the furnace roof and typically has four nozzles directed toward four quadrants of the furnace below the burner. Using proprietary control techniques, coupled with temperature feedback, the burner can direct heat to any combination of the quadrants; delivering the efficiency benefits of direct flame impingement, while avoiding overheating by limiting the firing in any one direction.

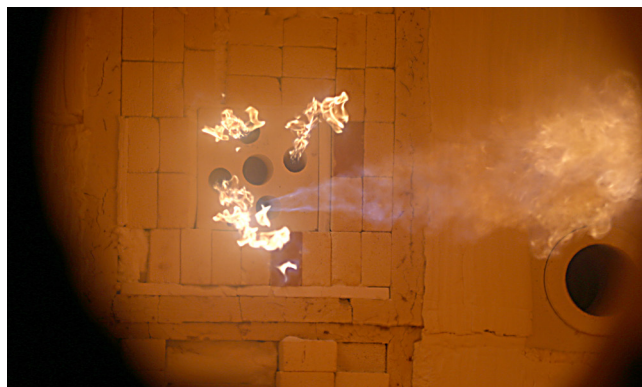
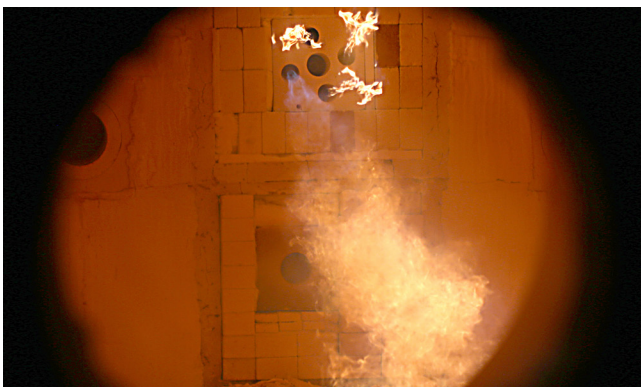
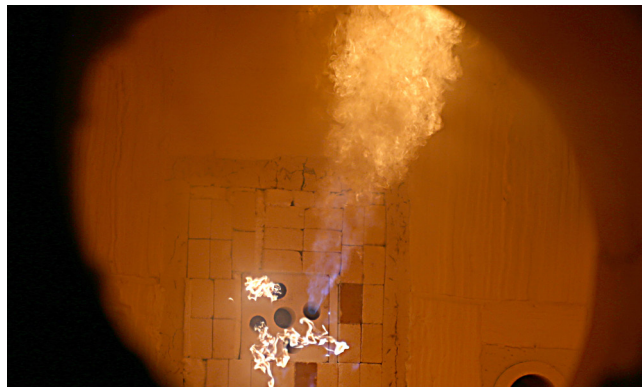
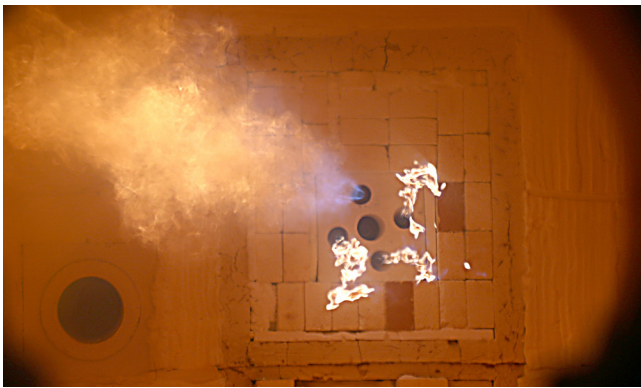
The quantity of energy and duration of time spent directing the heat flux towards a given area of furnace can be preset to a given frequency or automated by strategically located sensors in the furnace (auto-pilot) to direct more heat to colder areas and less heat to hotter locations. As a result, energy is delivered where and when it is most effective. The heat release profile of the Transient Heating burner can be customized for a specific furnace's needs, using the burner's ability to adjust velocity and flame length.

## Features

- Prevents overheating and non-uniform temperature distribution by delivering heat when and where it is needed in the furnace via a sensor-driven control strategy
- Minimizes oxidation and melt losses by creating a reducing atmosphere near the melt
- Designed to drive heat into the melt and away from the furnace roof
- Minimizes NO<sub>x</sub> generation by lowering flame temperature via staging of fuel and oxygen, even when interacting with stray combustion air
- Fabricated for ease of installation and maintenance
- Can be used in full oxy-fuel installations as well as in boost applications, in conjunction with air-fuel sidewall or regen burners
- Ability to process oily scrap, with reduced production delays and lower fuel and emissions

## Data Monitoring / Process Control

The Transient Heating burner features Air Products Smart Technology. This system uses sensor and communication technology to monitor and control burner operation, as well as track key process parameters. Your personnel can receive alerts and remotely access this data for improved process understanding.

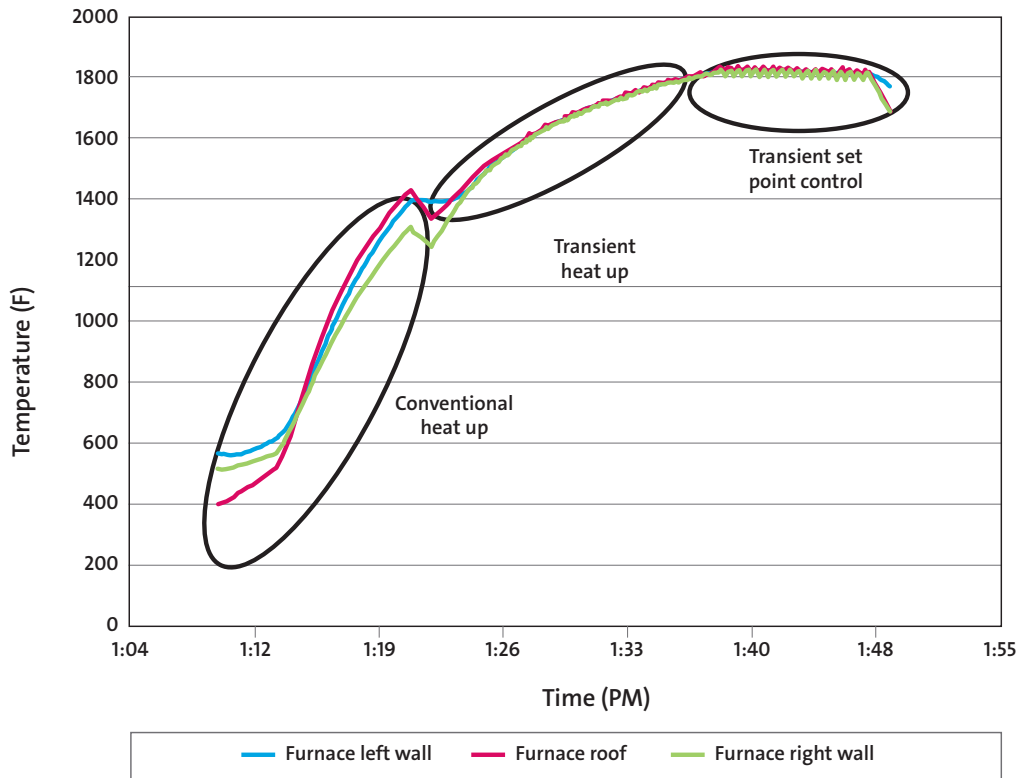


The Transient Heating burner is typically mounted on the furnace roof with four nozzles and can direct heat down to the melt in any combination of the four flames to heat more evenly, eliminate cold zones, and maximize melt rates.

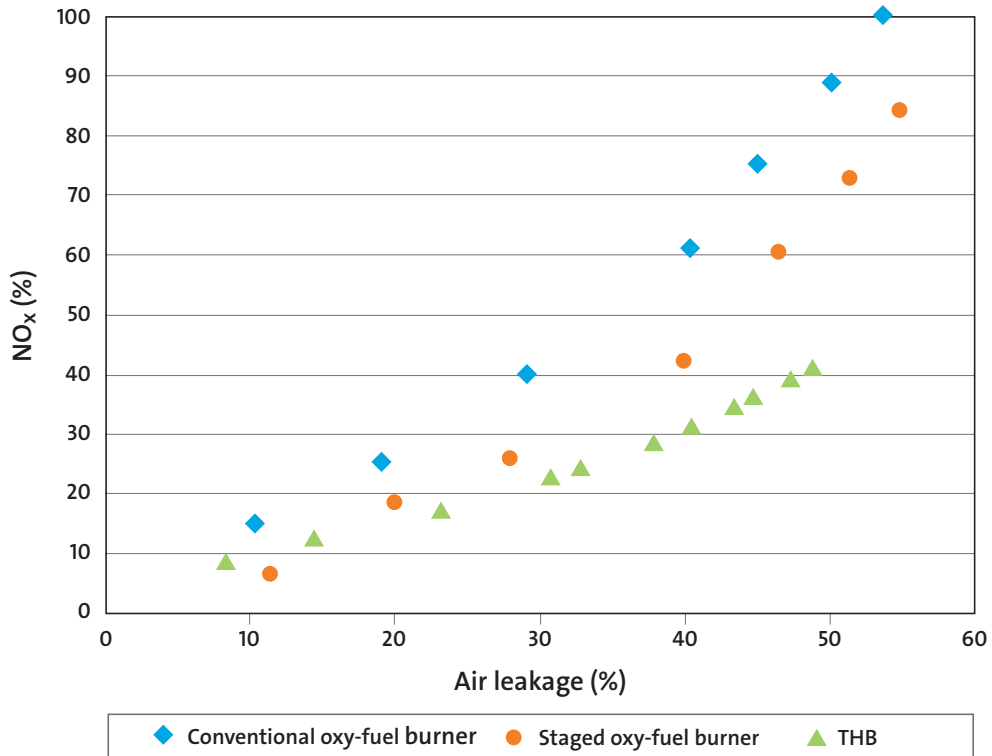
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## The Air Products advantage

Air Products is a global, leading industrial gas supplier. For over 75 years, customers have depended on us for reliable supply, services and technical solutions. Our engineers have worked side-by-side with non-ferrous metals producers for decades—helping them increase yield, improve production, decrease harmful fugitive emissions and reduce energy consumption and fuel cost throughout their operations. It's our goal to match your needs with an optimal gas system and innovative technologies.



Comparison of furnace temperature heat up and set point control using conventional heating vs. Transient Heating.



The Transient Heating burner minimizes NO<sub>x</sub> production when interacting with stray combustion air. (Air leakage is percent of total flue gas volume)  
 Note: Data obtained in Air Products' combustion labs under standard conditions; NO<sub>x</sub> data normalized.

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