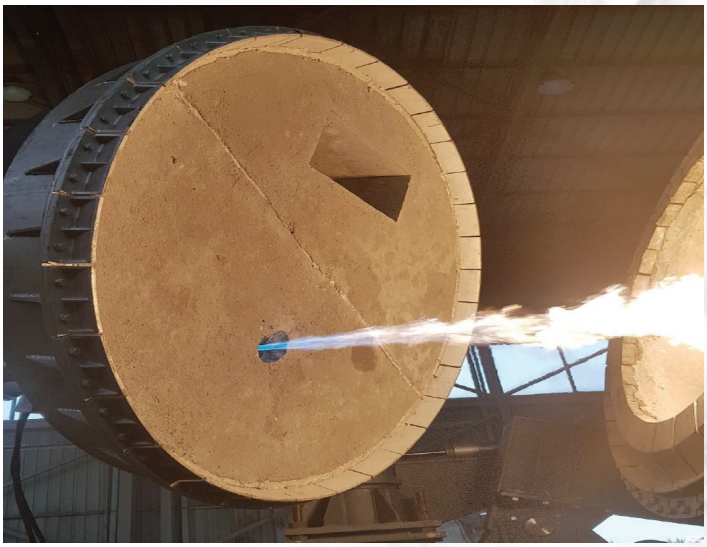
OptiFlame Rotary Furnace Combustion System

- Oxy Fuel as Hybrid Oxy/Air-Fuel Burner
- Lowest energy consumption
- Highest Productivity
- Metal yield



Tilting Rotary Furnaces equipped with OPTIflame Rotary Technology

Rotary fuel, equipped with OptiFlame Combustion Technology, excel in recycling a wide range of materials, including aluminum, lead, zinc, copper, and tin. Whether it's scrap, bulk, crushed materials, shot chips, or slag oxides, our technology can handle it all. In addition, they are also capable of melting ingots and foundry weights.

Choose from our range of options, including pure Oxy-Fuel Burners or Oxy-Fuel Burners with Air staging. Oxy-fuel burners not only enhance yield but also boost productivity. In recent years, our extensive research has been dedicated to flameless combustion, a revolutionary approach to achieving lower emissions and improved thermal efficiency.

This process, characterized by elevated reactant temperatures and low-temperature combustion, occurs without visible or audible flames under optimized conditions. Key to this technique is the concept of exhaust gas and heat recirculation. The heat from exhaust gases is utilized to elevate the temperature of the oxidant and fuel streams, while exhaust gases dilute the oxidant to maintain low temperatures in the combustion zone.

The outcome is stable flame stabilization, uniform temperatures throughout the furnace, reduced temperature gradients, and controlled maximum temperatures, leading to minimized dross and reduced refractory wear.

Why Oxy-Fuel Combustion?
Nitrogen molecules form air don't absorb or radiate energy well, which results in 50% of energy input being wasted, going right up the flue. Oxy-fuel nearly doubles the heat transferred compared to Air-fuel. Our OPTIFLAME Lade Pre-heating Technology employs these advantages to maximize the energy transfer and to reduce the total heating time. This improves not only the heating rate, but also the way how the ladle heats through and thus reduces temperature shock on the refractory and maximize the refractory lifetime. Holding the temperature inside a ladle consumes much less energy as well, reducing CO^2 at the same time. Reducing the heating time allows a reduction of pre-heating stations and to better utilize your assets.

Oxyfuel burners with in-furnace flue gas recirculation, originally developed in the late 1970s, have evolved to simulate traditional air flames with a high-momentum, low-temperature flame. The concept advanced in the late 1980s, approaching the conditions of a "homogeneous reactor" where furnace temperatures and species concentrations are uniform.

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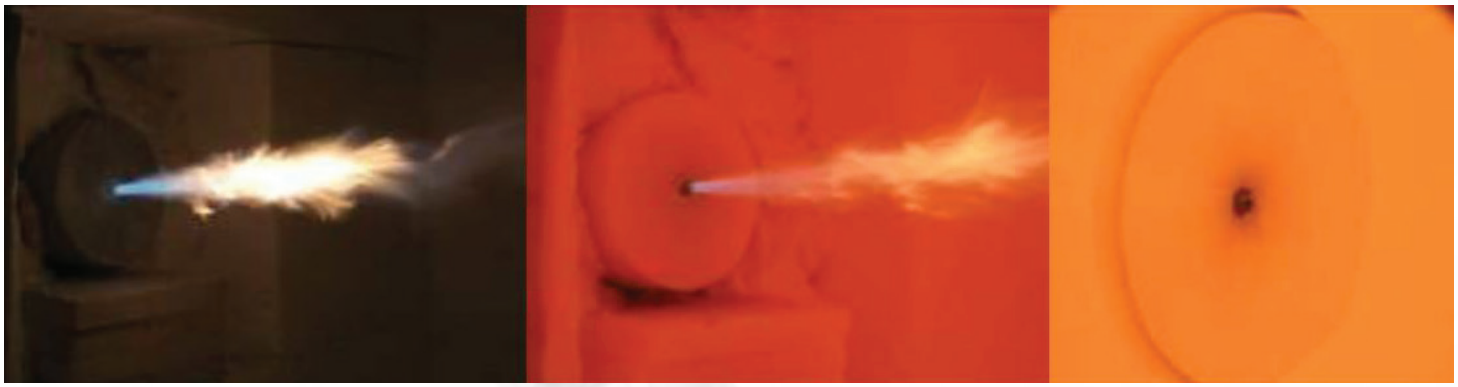
Known as "dilute oxygen combustion," this concept involves reacting fuel with a hot, dilute oxidant containing only 2 to 10% oxygen, resulting in a low flame temperature "reaction zone." The flame temperature can drop significantly above the hot oxidant temperature. Jets of oxygen or air are strategically placed to create a "hot dilute oxidant" by entraining furnace gas in a "mixing zone." The reaction zone and mixing zone are kept separate within the furnace to prevent direct mixing and combustion of oxidant and fuel.



400°C | 600°C | 900°C showing a flameless burner operation mode, where the flame is existing but invisible for the human eye.

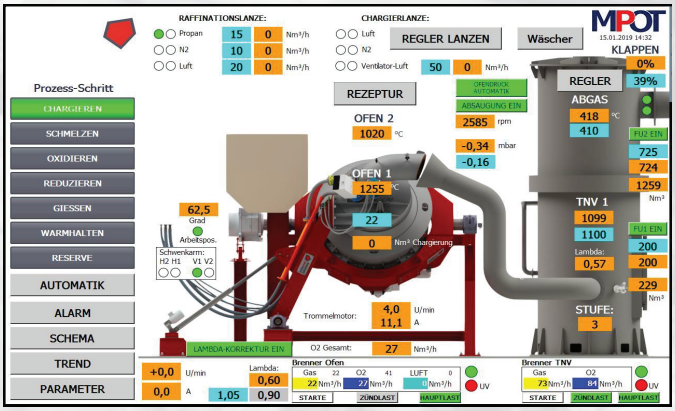
Electrical Design and System Evaluation

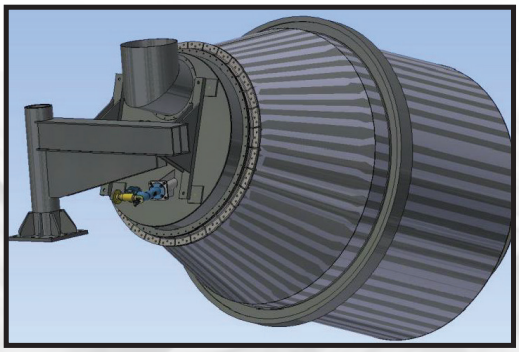
Our services encompass electrical design and a comprehensive system review. Our electrical design ensures a seamless connection to HW's safety shut-off/control piping skid, while the system review guarantees that all elements, including piping, electrical components, and field integration, are not only complete but also aligned with the specified requirements for optimal functionality. This review encompasses various sub-systems, such as flow metering, pilot burner control, and burner placement. In case of discrepancies, we provide recommendations for corrective actions. Our services include:

- Creation of wiring diagrams for main enclosures, pilot field enclosure, and related burner functions (UV scanner, ignition, etc.).
- Development of wiring diagrams and enclosure layouts for the pilot/sweep enclosure, which will be locally constructed by Hotwork International.
- Software development for PLC/HMI integration, ensuring seamless burner control for furnace combustion operations.
- Recommendations on the mounting of burners, brackets, and pilot burners onto the door. This also includes a general schematic for the burner refractory opening and pilot insertion point on the door if the pilot is to be installed there.

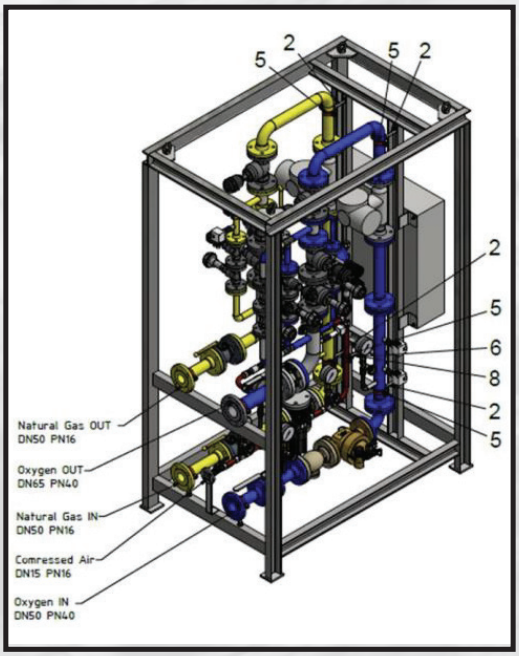
Hydrogen ready: We are ready for the future! All our burners are made hydrogen ready and will operate with natural gas, hydrogen, or any combination of these two fuels.

Automation: Our regulation skids come complete with a Burner Control Unit (BCU) or can operate with SIL devices slave to a higher-level CPU. Whatever a customer needs, we will design to meet that requisite interface. From standard to tailor-fit solutions.





Rotary Furnace



Compact Skid

24/7 Availability Worldwide

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