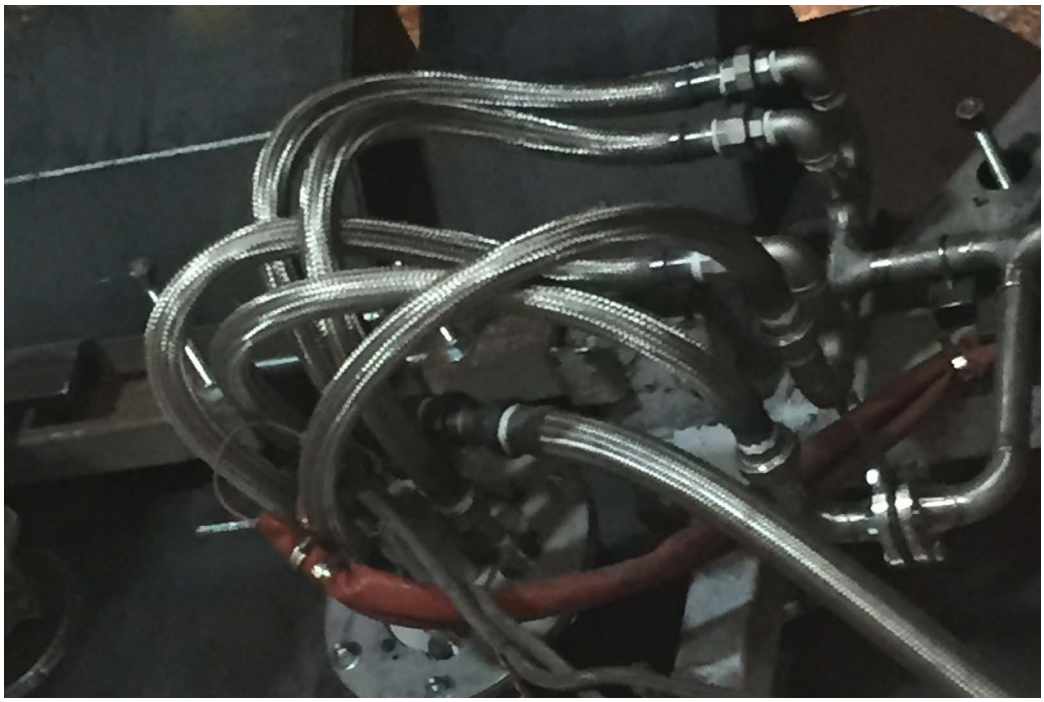
MESSER
Gases for Life

Low-temperature OXIPYR® for Aluminum Remelting

Uniform heating for higher productivity, no hot spots and less emissions



Summary

- Up to 100%, typically 30–50%, higher melt rate due to uniform heat distribution
- Up to 50% lower fuel consumption
- Low flame temperature, comparable to that of airfuel technology
- Reduced CO_2 and SO_2 emissions and ultra-low NO_X emissions

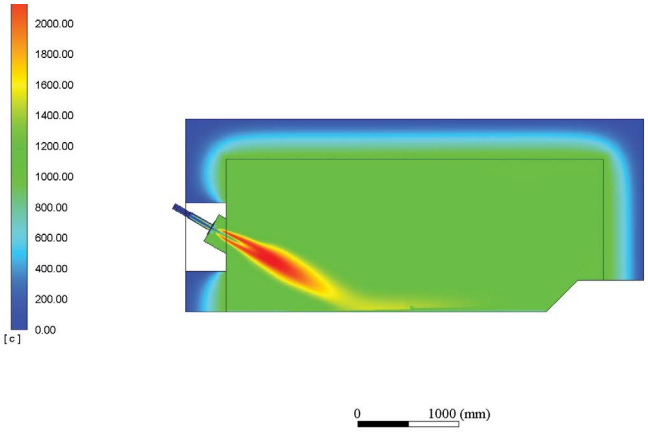
Challenge

With the increasing demands for non-ferrous metals, increasing the throughput of existing melting furnaces represents a challenge for the aluminum industry. Producers also need to constantly improve process yields, cut fuel consumptions and reduce gas emissions, such as CO_2 and NO_X. This market situation is familiar to Messer, with extensive knowledge and experience of combustion and customer processes.

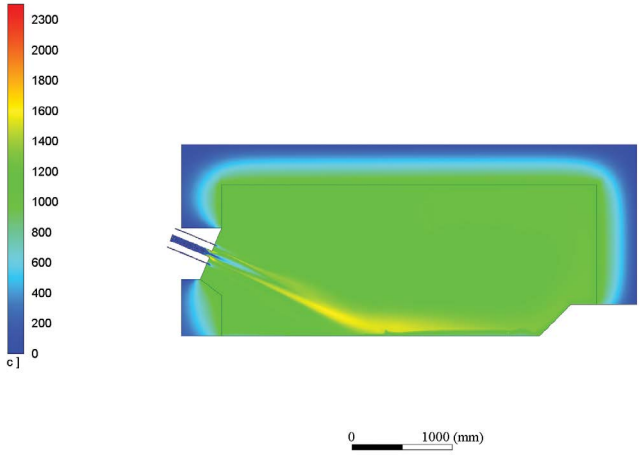
Low-temperature OXIPYR

Low-temperature OXIPYR combustion technology is uniquely designed for the challenges that exist within the aluminum industry. Such challenges include boosting capacity, reducing fuel consumption, improving yields, and reducing emissions while avoiding hot spots with uniform furnace temperatures. The combustion occurs under a diluted oxygen concentration by mixing the furnace gases into the combustion zone. This process slows down the oxyfuel combustion reactions and results in lower flame temperatures, comparable to those of airfuel technology, which are below the point at which thermal NO_X is created. The mixing of furnace gases into the flame also disperses the energy throughout the entire furnace for uniform heating and more efficient melting. The dispersed flame contains the same amount of energy but with a much more effective distribution. The overall result is more homogenous heating and melting, enabling not only a

higher power input and thus higher melt rates, but also reduced formation of dross and NO_X emissions.



In low-temperature OXIPYR, the flame is diluted with the furnace gases, which lowers the flame temperature and promotes an effective heat distribution.



In-furnace temperature measurement shows a uniform and low flame temperature without peaks, which significantly lowers the flame temperature and promotes homogeneous heat distribution.

OXIPYR combustion

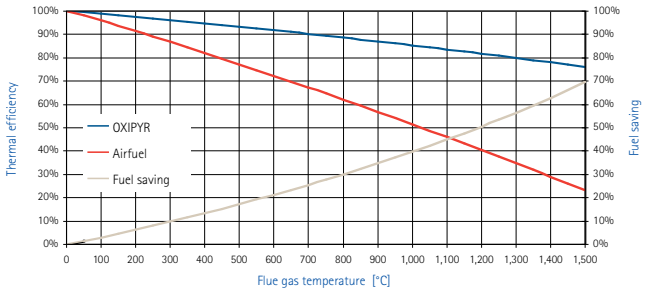
With OXIPYR combustion, removing nitrogen from the combustion and heat transfer process has several advantages including higher production output in new or existing furnaces, reduced fuel consumption, improved process control, and lower emissions. The thermal efficiency of low-temperature OXIPYR is equal to that of conventional oxyfuel.

Features

- Comparable flame temperature to that of airfuel technology
- Adjustable degree of flame dilution
- Suitable for all types of reverberatory furnaces
- Power: 0.5 to 15mm BTU/hour
- Self-cooling ceramic burner stone, 300 mm burner diameter, weight 175 lbs.
- Compact, powerful and modular design of burner for easy installation and maintenance
- Integrated flame monitoring by UV cell and pilot flame for automatic ignition

Customer benefits

- Low-temperature OXIPYR for a homogenous melting, resulting in increased furnace throughput capacity.
- Up to 100%, typically 30–50%, higher melt rate.
- Up to 50% lower fuel consumption
- Uniform furnace heating to avoid hot spots, thus reducing dross formation
- Low maintenance: no need for recuperator, electrical air blower or regenerative solution
- Substantially reduced flue gas volumes, up to 80%, for a compact exhaust solution
- Major reductions in CO_2 and SO_2 emissions – up to 50%
- Ultra-low levels of NO_X emissions, reduced up to 90% reduction



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