MESSER
Gases for Life

OXIPYR™ for Ladle Preheating.

Fast and fuel-efficient oxyfuel preheating of vessels up to 100 tons in size.

Summary

- Compared to air-fuel, oxyfuel allows for fuel savings of up to 55%
- 25% shorter heating cycle
- Compact, simple, and powerful oxyfuel installation; easy to fit on any preheating vessel
- Flameless oxyfuel promotes a more uniform heating, therefore increasing refractory lining life, reducing the number of vessels in circulation, and effectively lowering CO_2 and NO_X emissions

Vessel preheating

Within the metals production industry, various types of vessels and runners are used to transfer hot, liquid metal between melting and casting operations. Typical examples are ladles, converters, tundishes, runners, pouring chutes, etc. These vessels and runners have ceramic linings of different types and quality that require preheating to minimize refractory wear and to assure the right metal quality. Preheating temperature is chosen by optimizing various factors such fuel economy, refractory lifetime, refractory quality, and liquid metal temperature as well as vessel design and tapping system. The issue of lowering greenhouse gas emissions, such as from CO_2 and NO_X, is not only an environmental concern but also an economic concern for modern metals production. Flameless oxyfuel combustion in preheating of various vessels, (such as ladles, AOD converters, tundishes, etc.) has long been proven to be an efficient method of cutting heating times, improving fuel economy, reducing greenhouse gas emissions and extending vessel refractory lining life.

The OXIPYR™ system now makes this energy efficient preheating application available for use in smaller vessels and runners such as foundries and micro steel mills. To further improve their performance, flameless oxyfuel is applied.

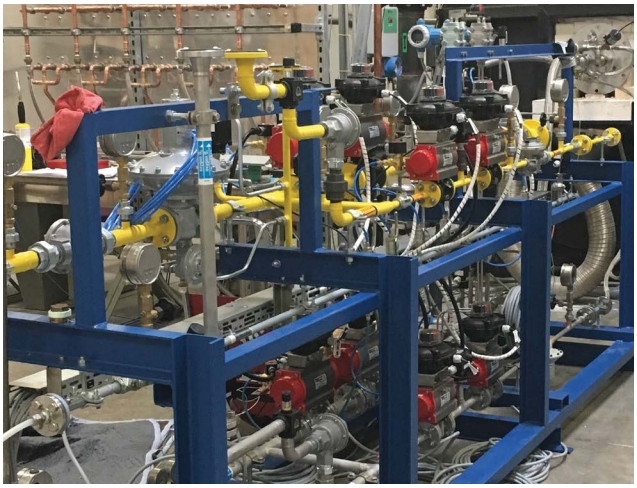
Flameless oxyfuel

Flameless oxyfuel combustion technology is uniquely designed to boost capacity, reduce fuel consumption, improve temperature uniformity, and lower emissions. The combustion occurs under diluted oxygen concentration as flue gases are mixed into the combustion zone. This slows down the oxyfuel combustion reactions and results in lower flame temperatures, which are below the point of thermal NO_X creation. The mixing of flue gases into the flame also disperses the energy throughout the entire vessel for faster and more uniform heating. The dispersed flame contains the same amount of energy but with more effective heat distribution. The overall result is more homogenous heating, further decreased fuel consumption, and reduced emission of NO_X.

The OXIPYR preheating system works in a flameless mode with only the pilot flame continuously visible.

Features

- Compact, rugged, and modular oxyfuel burner system; self-cooled (ceramic) type; integrated burner pilot and UV cell
- Separate flow trains for fuel and oxygen
- Process control system with modulating control towards a preset temperature or temperature curve
- Plug-and-play functionality with pre-adjusted components



Customer benefits

- Up to 55% reduction of fuel consumption and CO_2 emissions
- 25% shorter heating cycle for ladles
- Flameless oxyfuel promotes more uniform heating to further extend refractory lining life
- Flameless oxyfuel effectively lowers NO_X emissions
- Compact, simple, and powerful oxyfuel installation; easy to fit on any vessel
- A hotter ladle allows for lower metal tapping temperature therefore saving energy, refractory lining, and reducing the number of rejections (returns because metal temperature too low)
- Faster heating, which could reduce the number of ladles in circulation
- Hotter and uniformly heated vessel for improved cast product quality

Brief specifications

- Nominal power: 5 mm BTU/hr oxyfuel (maximum power is 20 mm BTU/hr)
- Built-in leakage check, burner ignition, and ladle purging functions
- Modulating control to temperature set-point; programmable heating pattern possible; pilot flame always on (50,000 to 135,000 BTU/hr)
- Oxygen: 12,000 scf/hr at 72.5-145 psi(g)
- Natural gas: 5,000 scf/hr at 14.5-43.4 psi(g)

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