American Combustion

PYRETRON™

Advanced Oxygen-Air Burner Technology for Aluminum Melting

Demonstrated Benefits

- Nearly 50% fuel reduction
- Increased furnace production capacity
- Flexible operation with variable air-oxygen flows
- Lower production cost

The PYRETRON™ system uses a patented method to combust various fuels with air and oxygen to significantly increase the efficiency and heat transfer characteristics of the flame. The result for aluminum melting applications is dramatically higher fuel efficiency and increased metal production.

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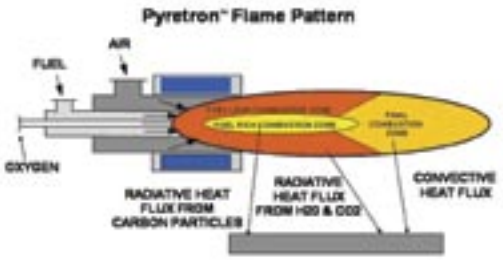
AIR LIQUIDE

PYRETRON™

The net result of using Pyretron™ is that for every unit of oxygen used, more than one unit of fuel is saved. At current fuel prices relative to oxygen, the result is a significant energy cost savings per pound of aluminum.



PYRETRON™ technology

The PYRETRON™ system uses air, fuel, and oxygen in a special, patented staged combustion approach:

- In the primary zone, fuel is burned with excess oxygen to produce a fuel rich, high emissivity and high temperature flame core for maximum radiative heat transfer
- In the secondary zone, air is used to provide flame shape, volume, and velocity, enhancing convective heat transfer
- In the final stage, primary and secondary zones recombine for efficient and clean combustion

Energy savings and optimum fuel efficiency with PYRETRON™

- Replaces air with oxygen and eliminates a portion of heat lost with nitrogen carried in air
- Improves mixing of fuel with air and oxygen to reduce excess air/oxygen needed for clean combustion
- Improves heat transfer from the flame so a higher portion of energy is transferred to aluminum
- For oil fuels: high efficiency atomizer achieves more complete and efficient oil combustion
- Advanced PLC combustion control algorithm optimizes fuel usage and production

PYRETRON™ Energy Savings in Recent Installation
using waste oil

	Before	With Pyretron	Savings
Fuel Used, mm Btu/lb [kJ/kg]	3000 [6900]	1570 [3600]	48%
Oxygen Used, scf/lb [m^3/kg]	-	0.937 [.055]	-
Net Energy Cost Savings*			36%

* At a fuel/oxygen cost ratio of 2.6 : 1

Higher production with PYRETRON™

Experience with production capacities of existing furnaces has shown:

- Up to 50% higher melt rate achievable for aluminum melters
- No additional metal yield losses
- Lower net production cost per pound of aluminum produced

Characteristics of the PYRETRON™ method of combustion

- Increased radiative and convective heat transfer for maximum production
- Lower energy cost, lower cost of production
- Reduced temperature of flue gases due to better heat transfer to the aluminum
- Multiple fuel capable: natural gas, propane, light to heavy oils, and waste oils
- High pressure, high efficiency oil atomizer for use with waste or clean oils
- Lower flue gas volumes by using oxygen to replace a portion of combustion air
- High thermal turndown and flexibility with variable air and oxygen rates
- Advanced process control loop, using PLC and proprietary algorithms for precise control of furnace roof and metal bath temperatures

Contacts

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