REBOX® HLL Oxygen Technology.
Flexible benefits in your heating furnaces.

Summary
- Fuel savings up to 323 BTU/scf using oxygen, resulting in reduced CO₂ emissions.
- NOx reduction between 5 and 25% depending on number of zones installed.
- Reduced exhaust gas volumes in HLL zones.
- 75% replacement of air with oxygen.
- Higher flexibility with variable energy content of fuel.
- Increased productivity
- Better temperature uniformity.

Challenges
All rolling mills are facing rising demands: higher productivity and availability, tighter emission limits, higher fuel prices, and increased quality demands. All these requirements have to be met to remain a future player in the market.

Solution
After more than 20 years of technical cooperation with the steel industry, Linde has gathered extensive experience and customer process knowledge. To further improve the flexible operation of steel reheat furnaces, Linde has developed the REBOX® HLL technology.

With REBOX® HLL (High Level Lancing) about 75% of the air needed for combustion is replaced by industrial grade oxygen, which corresponds to 50% oxygen in the oxidant. Existing burner systems remain in operation and are equipped with special HLL-lances that establish a flameless-like combustion. This leads to reduced NOx emissions, reduced energy usage, and increased production/heating capacity in steel reheating furnaces with side- or front-wall mounted burners.
Benefits

About 75% of the combustion air is replaced with oxygen in zones operated with HLL. This will reduce the exhaust gas volume per MW by more than 50%.

- Existing air/fuel system remain in use
- Robust system, seamless changeover between HLL and standard operation
- Establishes flameless combustion in existing burners
- Reduced exhaust gas volume and temperature
- Fuel savings of up to 323 BTU/scf with oxygen
- Reduced CO₂ and NOx emissions
- Increased production capacity
- More uniform temperature distribution

Installation results

For more specific information see printed reference sheets.

50% oxygen in oxidant results in large reductions of flue gas volume and combustion air.

Approximately 75% of total oxygen needed is added through lances.

Lance installed in furnace wall.  Flow train for REBOX® HLL.