Linde Gas

LINDARC® Laser System

Precision measurement of off-gas CO, O_2 and temperature

Customer

Marienhütte steel works is Austria's largest producer of reinforcing steel. It melts non-alloyed scrap steel in a 35-tonne electric arc furnace (EAF). The molten steel is continuously cast into steel billets, which are manufactured into reinforcing bars and round bars in a subsequent rolling mill.

Challenge

- Improve process efficiencies
- Reduce costs
- Increase productivity

Solution

The company installed Linde's LINDARC® Laser System to measure emissions and temperature in the off-gas.

Key furnace data

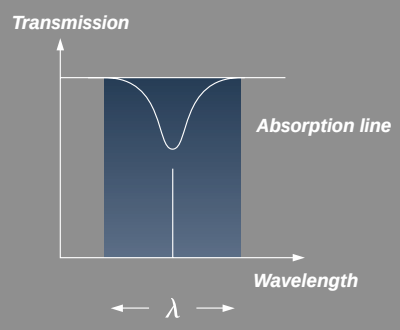
- EAF capacity: 38 tonnes
- Annual carbon steel capacity: 330,000 tonnes
- Tap to tap time: 45 minutes
- Electrical consumption: 380 kWh/t
- Total oxygen use: 42 Nm^3/t
- Water-cooled lance
- KT oxyfuel burners
- Post combustion injectors
- Off-gas dust load > 100 g/m^3

Concept

LINDARC® Laser System is an in-situ laser system for measuring oxygen (O_2) and carbon monoxide (CO) emissions in the scrap melting process. It also measures temperature. By using the single-line spectroscopy measurement technique in the near infrared spectral range, LINDARC® Laser System guarantees precise results even with a high water and dust content. The laser light is absorbed by the gases. The degree of absorption is determined by the volume of O_2 and CO in the off-gas.

As LINDARC® Laser System works on-line, it enables furnace operators to fine-tune burner and oxygen setting on an ongoing basis, thus ensuring closed-loop control over the combustion process.

Linde has partnered with the world-leading suppliers of electrode regulation systems and leading furnace suppliers to ensure best-in-class solutions based on the LINDARC® Laser System.



Laser scanning

Specifications

- Two lasers – one for CO and one for O_2
- Laser beam crosses the off-gas system just behind the false air gap
- The lasers are protected by rugged water-cooled housings
- Cooling water consumption: 6 m^3/h
- Nitrogen purging consumption: 20 – 30 Nm^3/h
- Temperature readings obtained from laser measurement

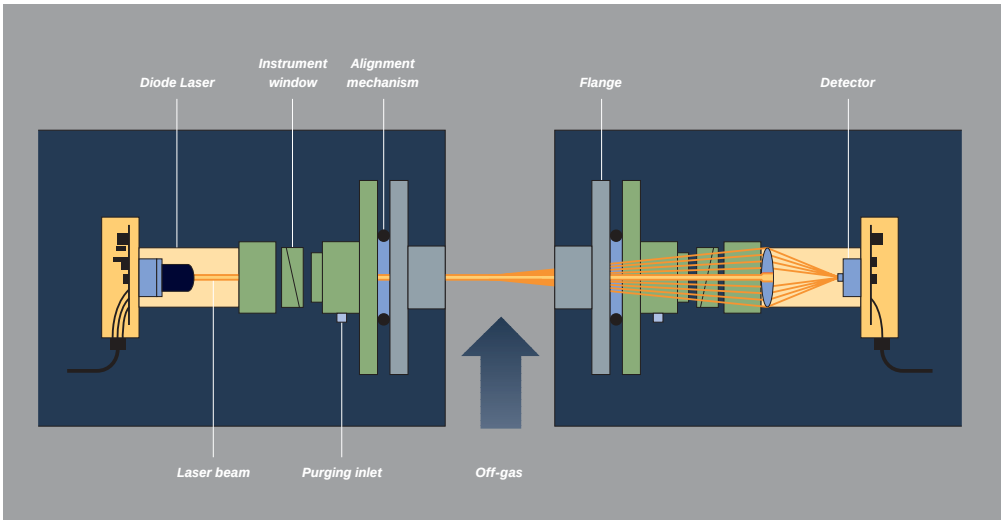
Benefits

- Process optimization
  More accurate control over O_2 and CO parameters, e.g. right amount of O_2 at the right time
- Decreased melting time
  Fewer maintenance interruptions
- Reduced costs
  Tighter control over the oxygen feed

Customer's words

"LINDARC® Laser System has enabled us to reduce oxygen use, at the same time optimizing furnace operation. In addition, we have improved CO safety in the bag house."

Helmut Sommerauer, Plant Manager at Marienhütte



NEO LaserGas Monitor

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