

REBOX®

Oxyfuel combustion in 40 pit furnaces



Customer

Ovako Steel AB, Hofors works, Sweden

Equipment

- Oxyfuel burners
- Flow trains for oxygen

Fuel

Oil

Installation date

1994 – 2004

Background

Ovako Steel AB, an SKF-subsiidiary, is world leader in producing bearing steels. The company is also a major producer of other special engineering steels. The Hofors works is complete with steel-making, ingot casting, billet and heavy bar mills as well as tube and ring-rolling mills. They set out in the early 1990s to reduce the emissions of NO_x but also to lower fuel consumption and raise heating capacity. The first oxyfuel installation took place in 1994 and Ovako Steel has since then, over a 10-year period, continuously revamped a total of 40 pit furnaces into all oxyfuel operation. The pit furnaces have been rebuilt from being groups of four pits connected to one recuperator into separately regulated pit furnaces.

Customer objectives

- Low NO_x emissions
- Reduced fuel consumption
- Increased heating capacity
- Standard solution for all furnaces

REBOX® – leading-edge technology

AGA, a member of the Linde Group, has pioneered the use of 100% oxyfuel applications in reheat furnaces in close cooperation with customers since the beginning of the 1990s. The installed base now sums up to over 85 furnaces. This broad application and technology experience results in fast and safe project handling and drives the development of oxyfuel technology, for example, flameless technology.

Using oxyfuel combustion substantially increases the thermal efficiency of a furnace. The main reasons for this is that the radiant heat transfer properties of the furnace gases produced by oxyfuel combustion are significantly better than those of airfuel. Also, due to the absence of nitrogen in the combustion mixture, the volume of exhaust gases is reduced substantially, thus the total heat losses via the exhaust gases are also reduced. As a result of the improved thermal efficiency, the heating rate and therefore productivity are increased, and less fuel is required to heat the product to a given temperature, i.e. specific fuel consumption is reduced. This helps to make a valuable contribution to reducing the overall environmental impact of the company's operations on the local environment.

The equipment installation

- Each pit furnace has one oxyfuel burner of 0.8 MW capacity
- Total power installation of 32 MW in the 40 pit furnaces
- Ceramic type oxyfuel burners
- Flow trains for oxygen and fuel
- The customer removed recuperators and reused the flue gas channel. The furnaces were revamped with new refractory.

Results

- 35% increased heating capacity in existing furnaces
- Reduced fuel consumption by 35%
- NO_x emissions below 150 mg/MJ

Customer benefits

- Increased production capacity and flexibility in existing furnace
- Reductions of CO, CO₂ and NO_x to allow continued production
- Reduced fuel consumption and no electricity for any air blowers
- Reduced overall flue gases by 80%
- Simple retrofit since powerful and compact oxyfuel burner technology. No need for recuperators or air blowers.



Subject to change
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