

OVAKO

THE LINDE GROUP

Linde

REBOX[®] HLL – High Level Lancing oxygen technology.

Ovako increases capacity, saves fuel and reduces emissions at its reheating furnace.



Customer.

Ovako is a leading European producer of engineering steel for customers in the transport, manufacturing, construction and agricultural industries. Every year, it supplies two million tonnes of wear-resistant products made from low-alloy and carbon steel to rolling and bearing manufacturers, heavy vehicle and automotive

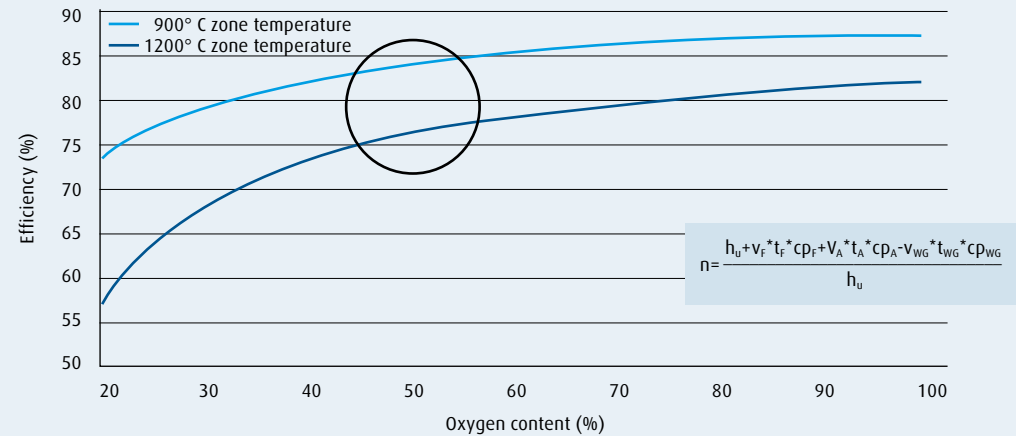
players and engineering companies. Ovako Smedjebacken's production site specialises in long steel products, and has both a melt shop to produce billets and a medium rolling mill. The billets are reheated in a walking hearth furnace, where they are heated to temperatures of up to 1180°C for approximately two hours.



Anders Lugnet, Furnace and Combustion Expert of Ovako Group (left) and Mats Jonsson, Linde Steel expert (right) in front of the REBOX HLL technology.

Challenge and solution.

Combustion efficiency at 400°C combustion air temperature depending on oxygen content



Challenge.

Ovako used conventional air/fuel burners in its reheating furnace for steel billets. To maintain its leading position in the European engineering steel market, the company was interested in increasing production capacity and enhancing process efficiency.

In concrete terms, Ovako was looking to upgrade its reheating system to improve safety and enable a great degree of automation. It also wanted to lower fuel consumption, improve heating efficiency and reduce carbon dioxide (CO₂) and nitrogen oxide (NO_x) emissions. By reducing the flue gas volume and its temperature, the company would additionally be able to reduce the load on the recuperators.

Solution.

To meet these challenges, Ovako contacted its long-standing, trusted partner Linde Sweden. Linde's in-depth expertise in reheating furnaces,

combustion technologies and reheating processes made it the partner of choice as Ovako knew that Linde could provide an all-inclusive package for its productivity and efficiency targets.

Building on the experience gained serving steel customers over more than twenty years, Linde developed REBOX[®] HLL (High Level Lancing) specifically to improve the flexibility of reheating furnaces by supporting performance ramp-ups on demand. It is a simple, cost-effective way of optimising reheating furnaces that does not require major changes to the furnace infrastructure so the existing combustion system can remain in operation.

Linde recommended that Ovako install Linde's REBOX HLL solution and Ovako agreed. In 2013, Linde managed the entire retrofit project. In addition to upgrading the existing flowtrain and installing a new flowtrain for oxygen, Linde also installed the piping and a completely new control system.

Technology and benefits.



Technology.

With REBOX HLL, oxygen lances are mounted in the furnace walls next to conventional burners. These are then used to inject oxygen at high velocity into the furnace and replace most of the air used for combustion. Up to about 75% of the combustion air is thus replaced with oxygen in zones targeted by HLL. The elimination of nitrogen increases thermal efficiency, also decreasing exhaust gas volumes and NOx emissions. In fact, it cuts exhaust gas volume per MW by more than 50%. Improved heat transfer also helps to reduce energy consumption. In addition, REBOX HLL provided Ovako with more uniform heating for improved billet quality.

REBOX HLL can be turned off at any time, enabling the furnace to go back to its normal air/fuel operating mode. Hence it is an ideal way to ramp up performance temporarily, for instance to accommodate fluctuations in demand.

Benefits at a glance.

- 20% increase in production capacity
- Up to 15% reduction in fuel consumption
- Low investment cost with reuse of existing air/fuel equipment
- More flexible operations with on-demand activation of REBOX HLL
- NOx emissions now below the statutory requirements
- More uniform temperature distribution for higher surface quality
- Ease of operation with highest safety standards
- Less maintenance
- One-stop turnkey delivery with fast installation and performance guarantees



“With REBOX® HLL, Linde provided us with a one-stop, all-inclusive solution to increase productivity and save fuel while also reducing NOx emissions. It has given us a proven, low-CAPEX route to the flexibility we need to stay competitive in a global marketplace.”

Anders Lugnet, Furnace and Combustion Expert of Ovako Group

Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

Linde AG

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