



**90% OF ALL STEEL PRODUCED
IN SCANDINAVIA IS HEATED IN
FURNACES CONTROLLED
BY FOCS**

PREVAS FOCS

FURNACE OPTIMIZATION CONTROL SYSTEM



DO YOU WANT TO:

- **REDUCE ENERGY CONSUMPTION BY 5-20%?**
 - **INCREASE PRODUCTION BY UP TO 28%?**
 - **REDUCE SCALING AND DECARBURIZATION?**
 - **REACH A MORE CONSISTENT PRODUCT QUALITY?**
- THEN FOCS IS FOR YOU!**

FOCS – DON'T USE MORE ENERGY THAN NECESSARY

Steel production requires lots of energy and in these times, when the market competition is getting ever stiffer, it becomes ever more important to keep tabs on one's production costs. Consequently, Prevas has, in cooperation with Sweden's industry organizations Jernkontoret and Swerea Mefos, developed a number of advanced control solutions for reheating and annealing furnaces. The resulting product family, called FOCS, includes automatic control systems which are market leaders in optimization and control of such furnaces. With FOCS we are able to achieve a consistently high product quality while reducing energy consumption and increasing productivity.

THIS IS HOW IT'S DONE

FOCS calculates the material temperature both on the surface and inside every slab, billet or bloom. On this basis, the system is able to control furnace temperatures, discharge temperatures and the production rate very accurately while minimizing energy consumption. Thanks to FOCS, each workpiece gets its own heating profile, depending on dimensions, material and quality aspects. Depending on the production rates in the up- and downstream processes, FOCS adapts the furnace pacing so that the heated material is delivered to the next process section at the right time and at the right temperature for further processing.



IN DEPTH

FOCS is a supervisory control system. This means that it determines set-points for temperature in the various zones of the furnace and controls the furnace pacing on the basis of calculated workpiece temperatures and the current production status so as to achieve optimally heated material and optimal utilization of the furnace. Often, no changes need be made to the existing systems, meaning that FOCS can simply be added as a higher-level expert system, helping operators to run the furnace automatically and optimally.

FOCS OFFERS THE FOLLOWING FUNCTIONS:

- An operator interface, consisting of a number of interactive displays which are used flexibly and simply by operators for supervision, control and tuning of the furnace.
- Temperature calculations. The temperature distribution in every workpiece in the furnace is calculated in real time by a time-dependent heat conduction equation. The heat transfer in the furnace from the walls, the flue gases and the flames to the workpieces is calculated on the basis of radiation, convection and conduction.
- Temperature control. FOCS uses both feed-forward and feed-back control to calculate the correct temperature setpoints for the different zones of the furnace. Since the heating process is comparatively slow, feed-forward is essential for achieving fast and stable control of the furnace temperature. The feed-forward loop immediately changes the setpoint for a zone when the furnace pace or the heating strategy changes while the feed-back loop adjusts the setpoints for maximum discharge temperature accuracy.
- Pacing control. FOCS calculates a suitable pace for moving and discharging the workpieces in the furnace on the basis of current temperature status and other quality parameters of the material in the furnace.
- Reporting. Heating data for each workpiece, including information about positions, times and calculated temperatures. Reports on “Events & Alarms” and “Energy consumption and Production” are also available.

FOCS also manages planned and unplanned delays, gap generation, limitation in surface temperatures, gradients and equalization times, hot charging, adaptation from rolling, mixed fuels – and supports REBOX® HLL Oxygen Technology.



INSTALLATIONS

Approximately 90% of all the steel produced in the Scandinavian countries is being heated in FOCS-equipped furnaces. Over the last two decades, the system has significantly contributed to the success of makers of high-quality steel by offering higher productivity and lower energy consumption.

CONSISTENT PRODUCT QUALITY

There are versions of FOCS for continuous heating furnaces, pit furnaces, batch furnaces, continuous annealing lines and batch annealing. FOCS systems are installed and running at many locations in Europe, Asia, North America and South America with customers such as ArcelorMittal, JISCO, Celsa Group, Thyssen Stahl AG, Sandvik, SSAB, Ovako, Outokumpu, Ruukki and others.

SERVICE AND SUPPORT

Not only do we offer complete installations of FOCS but also consultation services, operator training, as well as analysis and tuning services. The system is reliable, as is our team, consisting of project managers, control system engineers and software developers who are available for service and support round the clock.

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With leading expertise in embedded systems and industrial IT, Prevas contributes by providing innovative solutions that create growth. Prevas was founded in 1985 and is the main supplier and development partner to leading companies in industries such as life science, telecom, automotive, defense, energy and engineering. Offices are located in Sweden, Denmark, Norway. The company has just over 600 employees. Prevas has been listed on the NASDAQ OMX Nordic exchange in Stockholm since 1998.