

Continuous Annealing Line SSAB

Borlänge, Sweden



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Schematic description of SSAB continuous annealing line



SSAB's Continuous Annealing Line (CAL) in Borlänge, Sweden is the only installation in Europe serving since years the market for High Strength Martensitic Steels. The heart of the installation (see schematic above) is the furnace section with its water quench unit and pickling unit allowing extremely high cooling rates to obtain the required mechanical properties for the special steel grades of this market. SSAB is not only advanced in this cooling technology but also sets new standards in the environmental protection and use of energy.

ANDRITZ Selas has supported this policy by designing the heat exchanger of the new Gas Jet Cooler for operation with hot water. The heated water is pumped in a system linked to the city of Borlänge heating-up 10% of the community's houses representing roughly 10.000 inhabitants.



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Last Revamp of 2008

ANDRITZ Selas has designed and installed a new “Combi zone” between existing Soaking and Rapid Jet Cooling. This zone is used in soaking mode without any temperature reduction of the strip in case the thermal cycle requires a start of rapid cooling / quenching-up from soaking temperature. This process is used for hardening the steel and permits to manufacture extra-high and ultra-high strength steels. With the new “Combi zone” it is now possible for SSAB to increase the latitude of cooling from an even higher temperature to very low temperatures in seconds achieving cooling rates above 500°K/sec. This sets new standards and allows SSAB to develop new steel grades for their market.

The “Combi zone” is used as slow cooling as soon as the heat cycle demands lower temperatures to enter the rapid cooling units. The design of the coolers has been made in order to give maximum flexibility and full control of operation to the steel maker. Each cooler is fully instrumented

and is controlled independently. Various modes of cooling are available and permit exact settings of the strip’s cooling rate.

Changing mode

Design of the new Gas Jet Cooler has been done in order to perform the shortest transition time from the cooling mode to the soaking mode and vice versa. This is very important for the steel manufacturer as it reduces time loss and waste of production during the two stages. Each step of the change over has been intensively studied in order to minimize transition time. Dummy coils or low quality coils are therefore avoided.



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Features

■ History

- 1982: Commissioning of the CAL
- 1998: Revamping by ANDRITZ Selas to increase the cooling capacity by introduction of a "Rapid Gas Jet Cooling" section
- 2008: Revamping by ANDRITZ Selas on an additional "Combi zone" allowing heating / soaking as well as cooling in the same zone.

■ General data

Capacity	500 000 tonnes/year
Max. furnace temperature	950°C
Protective gas (atmosphere)	5% H ₂ and 95% N ₂
GJC height	25 m
Maximum speed in the GJC	180 m/min
Strip Width	600 – 1550 mm
Strip Thickness	0.35 – 2.2 mm

