

North American Stainless Contracts SMS Group



North American Stainless (NAS), U.S.A., a subsidiary of the Spanish Acerinox Group, has contracted SMS group for the supply of a 20-roll cold rolling mill and a bright annealing line. NAS is erecting a modern, high-performance production facility for bright-annealed stainless steel strip in Ghent, in the U.S. state of Kentucky. The installed plants will be characterized by high efficiency, flexibility and product quality. The output capacity of the plant will amount to 95,000 tons per year. Commissioning will take place in early 2017.

With this investment, NAS is entering the market for bright-annealed stainless steel. For this material, which is partly imported, there is a market of stable growth in the U.S.A. The cold-rolled stainless steel strip of surface quality BA is characterized by a shiny, reflective appearance. The typical areas of application are household appliances and kitchen utensils. Furthermore, the material is used in many other areas where, in addition to the material properties of stainless steel, high-grade, reflective surfaces are required, for example, in medical engineering and in the transportation industry.

The new plants will manufacture both austenitic and ferritic grades (AISI 200, 300 and 400 series). The end material will be between 600 and 1,350 millimeters wide, and between 0.15 and 1.5 millimeters thick. In addition to the supply of the mechanical, process, furnace, electrical and automation

equipment, also the supervision of installation, commissioning support and training of the operating personnel belong to the contract scope. The complete strip steering systems will be supplied by EMG Automation.

The 20-roll cold rolling mill, a Monoblock mill of type MB 22B-54", will process up to 6.2-millimeter-thick hot strip. The compact and robust plant is characterized by high millstand stiffness. With a maximum rolling speed of 800 meters per minute and a maximum rolling force of 8,000 kN, thickness reductions of up to 90 percent can be achieved. The millstand will be equipped with hydraulic gap control and roll-crown adjustment systems for the B/C and F/G axes and with inner intermediate roll shifting. Also the auxiliary and service facilities are part of the supply scope.

For example, the 100 percent regenerative Supafine filter system will ensure environmentally friendly purification and cooling of the rolling oil. The fume exhaust system will also contribute to environmentally friendly plant operation, as it meets the most stringent environmental requirements imposed by the local authorities. In order to reduce non-productive times, an uncoiling group with straightener and crop shear will be integrated in addition to the two reversing coilers.

The bright annealing line will be the highest-performance of its kind in the U.S.A. Here the cold rolled strip will first be cleaned

from rolling oil and other contaminants in a two-stage cleaning section. This will be followed by recrystallization annealing in an oxygen-free, inert atmosphere with a high hydrogen content, creating a high-grade, reflective strip surface. A four-high skin pass mill will be integrated into the line for post-treatment, improving not only the surface and flatness of the strips but, thanks to low strain hardening, also the metallurgical characteristics.

The downstream tension leveler will perfect the strip flatness. In addition to tension leveling, in case of thin-gage strip, this plant can also operate as a pure stretcher. Subsequently, the strip can be trimmed on both sides. In the entry and exit sections, the strip will achieve a maximum speed of 75 meters per minute, while the maximum speed in the process section will be 50 meters per minute.

The technological highlight of the bright annealing line is the entirely electrically powered vertical furnace from Drever, a company of SMS group. The energy consumption, at approx. 220 kilowatt hours per ton, is 60 percent lower than in a conventional design with a muffle furnace. Furthermore, the shorter heating section enables the bay height to be reduced by 50 percent.

The high efficiency is achieved by means of direct heating via electrical heating elements and dynamic annealing at up to 1,250 degrees Celsius. The annealing process takes place in a pressurized inert atmosphere (up to 90 percent hydrogen). This ensures a low dew point and produces an immaculately reflective surface. A special strip stabilization system allows contactless positioning of the strip, preventing surface damage. The total furnace construction is made gas tight. Special sealing elements at the entry and exit minimize losses.

In order to keep the hydrogen requirement low, a recycling unit will be integrated to condition the used hydrogen and return it to the process. For strip cooling, the furnace will be fitted with two inert gas recirculation units. To maximize production and minimize resource consumption, all process parameters will be adjusted automatically based on a mathematical model.