

Endless casting and rolling plants: First ESP line in the USA to be built at U. S. Steel

ABP's parent company Primetals Technologies has succeeded in creating an ultra-thin endless strip

ABP parent company Primetals Technologies is supplying an Arvedi ESP line for the production of continuous strip to United States Steel Corporation (U. S. Steel) for the Edgar Thomson steel mill at its Braddock, Pennsylvania, production site. This is the very first ESP line to be built in the USA. The casting-rolling mill has a nominal capacity of 2.5 million tons of high-quality ultra-thin strips. With a maximum rolling strip width of 1956 millimeters, it will be the widest ESP line that has ever been built.

The Arvedi ESP line is designed for the production of strip with a thickness between 0.8 and 6 millimeters ranging from 965 to 1956 millimeters in width. The ABP parent company Primetals Technologies is primarily responsible for the engineering of the Arvedi ESP system and supplies mechanical equipment, media supply, technology packages and automation systems. ABP Induction in turn supplies a transverse field heating system as the core element of the ESP technology. The entire system has a fully integrated basic automation (Level 1) plus process optimization (Level 2) to control all casting and rolling operations. The scope of supply also includes a level 3 automation system, which also includes the transformers and the transformer station for the power supply. It also includes a modular coil transport system for coil transport.

With this investment, the Mon Valley plants will become the main source of substrate for the production of the company's industry-leading steel grade XG3™. This modern high-strength steel (AHSS) enables automotive manufacturers to comply with today's fuel consumption specifications. Besides producing sustainable AHSS steel, this project will improve the environmental performance, energy efficiency and carbon footprint of the Mon Valley site.

The Edgar Thomson mill in Braddock, Pennsylvania, as part of the U.S. Steel-operated Mon Valley plants, is an integrated steel producer that also includes three other separate facilities with a total annual crude steel capacity of 2.9 million tons. The site is responsible for the basic steel production of the Mon Valley plants. The facility features two blast furnaces, two BOF converters, equipment for vacuum degassing and ladle metallurgy, and a twin-strand continuous slab caster. The slabs are subject to further processing in another Mon Valley facility.

The Arvedi ESP process produces hot-rolled coils in a combined casting and rolling mill directly from liquid steel in a continuous and uninterrupted production process. The line starts out by casting a thin strand which is then rolled down to an intermediate thickness of 10 to 20 millimeters in a three-stand high reduction rolling mill positioned at the end of the continuous caster. Following the reheating process using induction heating, the transfer strip is rolled down to the desired final thickness in a five-stand finishing rolling line with subsequent laminar strip cooling.

The strip is then cut with high-speed shears immediately before the coils are wound. The full range of steel grades can be flexibly produced on Arvedi ESP systems. The energy consumption and corresponding costs of rolling mills of this type are up to 45 percent lower than those of conventional rolling mills with separate casting and rolling processes. They also tend to have significantly lower CO2 emissions. In addition, with a length of only 180 meters in this case, the dimensions of these rolling mills are considerably more compact than those of conventional casting and rolling mills.

About ABP Induction

ABP is a leading manufacturer of induction furnaces and systems for inductive melting and holding for the metal and metalworking industries. ABP is an expert in melting, pouring, holding and heating iron, steel and non-ferrous metals with design, production, assembly and services for foundries, forges and steelworks. The ABP Induction Group with over 400 employees has companies in the USA, Mexico, Sweden, Germany, South Africa, Russia, India, Thailand and China. It is represented by service and sales partners in most of the world's industrialized countries.

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