PRIMETALS TECHNOLOGIES

Press

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# Primetals Technologies receives first SRD segment slab caster order in China from Angang Iron & Steel

- **Modernization will improve slab quality for use in the plate mill**
- **Increased flexibility using SRD segments in the horizontal strand guide**
- **First application of SRD segments in China**
- **Maximum slab thickness increases to 360 millimeters**
- **Fast start-up thanks to "Connect & Cast"**

Chinese steel producer Angang Iron & Steel Group Co. (Angang) has placed an order with Primetals Technologies to modernize a continuous slab caster at its Anshan plant. The modernized caster will replace the existing CCM 1 in its steel works No. 1. The objectives of the project are to improve the slab quality for use in the subsequent plate mill and to increase maximum slab thickness from 300 to 360 millimeters. Furthermore, flexibility will be improved by installing SRD segments in the horizontal strand guide, which marks the first application of SRD (Single-Roll DynaGap) segments in a caster in China. The modernization is scheduled for completion in the third quarter of 2019. The "Connect & Cast" principle, based on preconfigured and pretested packages forms the basis for a fast plant start-up.

Angang is part of the Anshan Iron & Steel Group Co., one of China's leading steel producers with an annual production of more than 35.7 million metric tons (2017), and is located in Anshan in Liaoning Province. Steel works no. 1 in Anshan employs a conversion route with a basic oxygen converter, ladle furnace and RH plant. The single-strand continuous slab caster CCM1 in steel works no. 1, originally installed in 1999, has a production capacity of one million metric tons per annum. Its machine radius is 10.6 meters and the metallurgical length amounts to 34.7 meters. The caster produces slabs with a thickness of 250, 300 and 360 millimeters in a width range of 1,500 to 2,000 millimeters. Casting speeds vary from 0.4 to 1,5 meters per minute. The plant processes medium carbon to high carbon steels, micro-alloyed, low-alloyed, alloyed and high-alloyed steels as well as pipe and plate grades.

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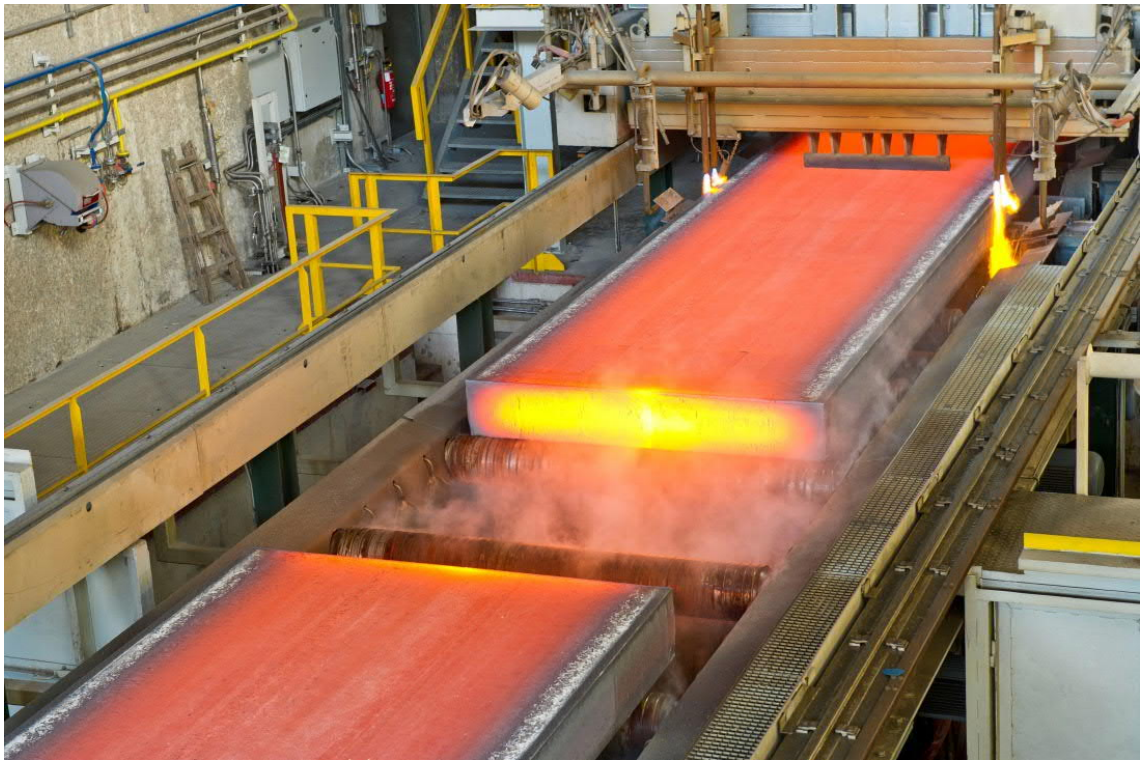
The caster will be equipped with LevCon mold level control. The straight cassette-type Smart Mold is equipped with the Mold Expert breakout detection system, DynaWidth for automatic width adjustment, and the DynaFlex mold oscillator. Smart Bender and Smart Segments as well as I-Star rollers are used in the strand-guiding system. The modernization project also includes the detail engineering of the tundish, tundish car, mold, oscillator, bender, segments and alignment stands, the supply of incorporated parts for the strand guide system as well as the complete supply of SRD hard reduction segments.

Precise knowledge of the final solidification point and the associated soft reduction is needed to reliably produce slabs for steel grades that require high internal quality. The new SRD segments from Primetals Technologies can be applied to the final solidification precisely. This enables each individual roll gap to be adjusted dynamically as a function of the steel grade, overheating, cooling or casting speed. Each roll transmits an individual force, which makes even higher thickness reduction rates possible, and reduces the segregation and porosity in the center of the strand. SRD segments are designed for long operating cycles and easy maintenance. For example, each roll has its own overload protection, which prevents damage to the bearings and surfaces of the rolls. The rolls are embedded in a function unit so that they can be quickly replaced either in a maintenance workshop or directly on the caster during a break in production. The individual roll units can also be tested and calibrated before installation in the segments.

The Dynacs 3D secondary cooling system dynamically calculates and controls the temperature profile along the entire strand. This enables the working points of the strand cooling, and thus the final strand solidification, to be determined precisely as a function of the casting speed, slab format and steel grade. DynaGap Soft Reduction is used to improve the interior quality of the slabs. The roll gap is dynamically adjusted during the final solidification in accordance with the operating points calculated by Dynacs 3D. This minimizes segregation in the center of the strand. The secondary cooling uses DynaJet spray cooling with a center/margin setting.

Furthermore, a number of expert system will be implemented. These include Nozzle Expert to check the condition of the secondary cooling system online and to detect clogged nozzles and leakages with high accuracy, Quality Expert for online tracking, control and supervision of quality related data and quality prediction for the cast products, contributing to the continuous improvement of the product quality, Speed Expert for the cyclic calculation of optimum casting speed in any casting situation considering the influencing factors like superheat and heat pacing, the Yield Expert cut length optimization system, which considers scrap portions, quality defects, weight restrictions and width changes in order to minimize the scrap and optimize the yield and Equipment Expert to monitor the installed caster equipment e.g. mold plates and gives the operator valuable information about preventive maintenance. Advisory services of erection, start-up and commissioning round of the scope of Primetals Technologies.

Connect & Cast is a registered trademark of Primetals Technologies in certain countries.



One-strand continuous slab caster from Primetals Technologies

This press release and a press photo are available at
www.primetals.com/press/

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**Primetals Technologies, Limited** headquartered in London, United Kingdom is a worldwide leading engineering, plant-building and lifecycle services partner for the metals industry. The company offers a complete technology, product and service portfolio that includes integrated electrics, automation and environmental solutions. This covers every step of the iron and steel production chain, extending from the raw materials to the finished product – in addition to the latest rolling solutions for the nonferrous metals sector. Primetals Technologies is a joint venture of Mitsubishi Heavy Industries (MHI) and Siemens. Mitsubishi-Hitachi Metals Machinery (MHMM) - an MHI consolidated group company with equity participation by Hitachi, Ltd. and the IHI Corporation - holds a 51% stake and Siemens a 49% stake in the joint venture. The company employs around 7,000 employees worldwide. Further information is available on the Internet at www.primetals.com.