

PRESS RELEASE

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SMS group supplies continuous caster with Industrie 4.0 technology for high-quality steel grades

Shandong Iron & Steel grants final acceptance for
ultra-wide medium-slab caster



The first slab produced on the new continuous caster.

Shandong Iron & Steel Group Co. Ltd., Rizhao, China, has awarded SMS group the final acceptance certificate, following the successful commissioning of its new continuous caster for ultrawide slabs.

The single-strand caster is designed for an annual production of 1.5 million tons of steel slabs with widths of up to 3,250 millimeters and a thickness of 150 millimeters. This means the casting machine is able to cast the widest slabs in the world. It processes structural steels, and micro and low-alloy steel grades. Peritectic grades make up more than 45 percent of the overall production output. The slabs are hot charged to the Steckel mill which rolls them down to sheet and hot strip.

Shandong Iron & Steel also ordered latest quality-enhancing digitalization solutions for the casting machine.

The digital HD LASr (High Definition Laser Aligning System remote) alignment assistant, developed by SMS group, guarantees that the molds and segments are perfectly aligned. HD LASr [mold] and HD LASr [segment] systems constitute an intuitive operating concept for high-precision measurement and the optimal setup of the molds and segments in the workshop, using a 3D system – an important prerequisite for high slab quality.

SMS group uses HD mold^{TC} (TC = Thermocouples) technology in this caster. Additionally, the narrow sides are equipped with HD mold^{FO} (FO = Fiber Optic sensors), Breakout Prevention Assist and Mold Temperature Assist systems.

The Breakout Prevention Assist system reliably prevents breakouts resulting from stickers in the mold, ensuring high availability and the effective protection of the machine against damage.

Mold Temperature Assist provides information in 2D or 3D about the distribution of the heat discharge, alignment of the submerged entry nozzle, stirring effect, and the contact between the strand shell and the copper plates.

In addition, the mold features HD mold^{FO} copper plates which are equipped with fiber optics for signal transmission. More than 500 measuring points are arranged over the complete mold surface, from the top to the bottom end of the mold. Only with HD mold^{FO} can the local strand shell thickness and the thicknesses of the liquid and solid flux layers be directly visualized. This provides more in-depth understanding of the solidification process.

Additionally, the plant is equipped with Industrie 4.0 technologies developed by SMS group for smart plant data processing and process automation. Based on the steel grades to be processed, the X-Pact[®] TechAssist system automatically selects the optimal technological parameter settings for the metallurgical process.

X-Pact[®] Process Guidance provides automatically – whenever needed - all relevant process information, prompts and HMI screens. All plant control and maintenance functions can be conveniently executed from the operator's station.

X-Pact[®] Business Intelligence combines the data from different systems, enabling interaction with dynamic applications and dashboards.

“Our very good collaboration with SMS group was characterized by mutual trust and highly effective results. With our new casting machine, we have successfully taken another step towards Industrie 4.0, something we are really proud of,” says Zheng Qiang, Marketing Department, Shandong Steel Group Rizhao Co., Ltd.

The continuous caster comes with a wide range of technologies that ensure very good internal quality of the slabs: the hydraulic-powered resonance oscillator, for example, and X-Pact[®] WidthControl, an online width adjustment system that sets the mold narrow sides during casting. Other features are the width-dependent air-mist secondary cooling system and the technological process model X-Pact[®] Solid Control (formerly DSC[®]).

SMS group supplied all the X-Pact[®] electrical and automation systems for the continuous caster, the

technological control systems (level 1) and the technological process models (level 2).

SMS group's scope of supply additionally included the training of the customer's personnel, supervision of local manufacturing, installation and/or supervision of installation activities, and technical assistance during commissioning.

SMS group is a group of companies internationally active in plant construction and mechanical engineering for the steel and nonferrous metals industry. It has some 14,000 employees who generate worldwide sales of more than EUR 2.8 billion. The sole owner of the holding company SMS GmbH is the Familie Weiss Foundation.