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Primetals Technologies to collaborate with JSW Steel USA on New Vacuum Degasser and Casting Infrastructure Upgrade at Mingo Junction Facility

- **Largest twin station vacuum tank degasser in North America will produce cleaner steel**
- **Extensive upgrade of 2-strand continuous caster to result in improved internal slab quality**
- **Exceptionally short downtime of 30 days for the slab caster upgrade**

Primetals Technologies and JSW Steel USA have entered into an agreement to upgrade the slab casting infrastructure at its Mingo Junction, Ohio, plant. The project encompasses steelmaking, secondary metallurgy, and continuous casting processes, the project is expected to enable JSW Steel USA to produce a wider range of sophisticated slab steels to diversify its product portfolio for additional markets.

Work on the project has begun and is scheduled for completion in second half of 2025.

Installing largest vacuum tank degasser in North America

Primetals Technologies will install a 230-metric-ton vacuum tank degasser (VTD) with a dry mechanical vacuum pump system. This will be North America's largest twin station vacuum tank degasser (VTD), allowing JSW Steel USA to produce cleaner steel and reduce levels of carbon, oxygen, nitrogen, hydrogen, and sulfur in different process steps.

"JSW Steel USA wanted to install this VTD at their existing Mingo Junction site with significant footprint and height restrictions," said Joerg Buttler, Head of Upstream Business for Primetals Technologies USA. "Working closely with JSW's Mingo team, we were able to create a custom design that worked for the space, budget, and metallurgical targets."

The VTD design includes all the mechanical and electrical equipment for the plant, including the mechanical dry pumps, vacuum filters, and dust catcher. It includes integrating new material handling technologies, associated auxiliary systems, metallurgical process model, and complete Level 1 and Level 2 automation systems.

"We look forward to the successful completion of these upgrades to strengthen our service capabilities and meet the growing needs of the renewable energy and infrastructure markets while in line with the Build America - Buy America Act (BABAA)," said Jonathan Shank, Chief Operating Officer of JSW Steel

USA - Mingo Junction. “The project will strengthen our commitment to sustainability while providing additional momentum for growth by widening our product portfolio.”

Remarkably short downtime for caster upgrade

For the 2-strand continuous caster upgrade, the project scope includes key mechanical equipment, Level 1 automation for strand No. 2, a complete Level 2 automation system, and the mold monitoring system Mold Expert. Moreover, JSW Steel USA has signed up for a long-term software subscription model, based on a software as a service (SaaS) concept.

Revamping a continuous slab caster usually means a shutdown period of several months. However, in this project, Primetals Technologies managed to cut the downtime to 30 days. This timeline is possible by keeping the concrete foundations and strand supporting structure. In that way, there is no need for time-consuming demolition work. The new strand containment will be fixed with a specially designed adapter solution, which is another important factor influencing the short downtime.

A patented continuous bending and straightening process, Smart Segment allows for online and remote adjustments of the roll-gap at one of the strands. This strand will be dedicated to producing API grades and plates of high quality for the US market. The setting of the Smart Segments is based on advanced mathematical models developed by Primetals Technologies. These models ensure that the caster already in the design phase is optimized to eliminate the risk of unsteady mold level bulging.

Models for quality improvements

Having real-time knowledge about the exact temperature at any point within a continuously cast strand is highly valuable for achieving fully optimized secondary cooling of the slabs. This is made possible with Dynacs 3D, a secondary-cooling model for adjustment of cooling setpoints. Additionally, the model calculates the point of final strand solidification, which enables exact control of the cooling process. The caster will also be equipped with DynaGap Soft Reduction 3D, a dynamic soft-reduction package that gives operators precise control during slab solidification and significantly improves internal quality by reducing center segregation. DynaGap is a strand-guide system, allowing operators to adjust the roll gap at the push of a button.

Key facts: JSW Steel USA's new vacuum tank degasser

- Plant type: Twin type vacuum degasser with vessel car and fixed and liftable cover
- Capacity: 230 million tons
- Major Equipment: vacuum filter, dust catcher, and set of dry mechanical pumps

Key facts: JSW Steel USA's new slab caster

- Thicknesses: From 228.6 to 304.8 millimeters
- Widths: From 991 to 2,032 millimeters
- Radius: 10.5 meters
- Metallurgical length: 26.45 meters

Key facts: automation systems subscription model

- JSW Steel USA receives new releases, upgrades, and updates on a regular basis
- The service package included in the annual license fee also includes remote support for troubleshooting, advice, training, fine-tuning, or optimization
- The automation systems stay compatible with the latest hardware and operating systems, new functions can easily be integrated in future, and capital investments are replaced by annual operating expenses



Representatives from JSW and Primetals Technologies during the contract signing meeting. JSW Steel USA has been a long-time customer of Primetals Technologies and the new agreement is an extension of the business relationship between the two companies.

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