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Primetals Technologies to Collaborate with JSW Steel U.S.A. 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 U.S.A. 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, and the project is expected to enable JSW Steel U.S.A. to produce a wider range of sophisticated steels in the form of slabs 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-ton vacuum tank degasser (VTD) with a dry mechanical vacuum pump system. This will be North America's largest VTD to date, allowing JSW Steel U.S.A. to produce cleaner steel and reduce levels of carbon, oxygen, nitrogen, hydrogen, and sulfur in different process steps.

"JSW Steel U.S.A. 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 U.S.A. "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 staying in line

with the Build America - Buy America Act (BABAA),” said Jonathan Shank, Chief Operating Officer of JSW Steel U.S.A.’s Mingo Junction plant. “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 U.S.A. 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 results in 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 existing concrete foundations and strand supporting structure, which renders any time-consuming demolition work unnecessary. The new strand containment will be fixed with a specially designed adapter solution, which is another important factor leading to 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 Smart Segments parameters are set based on advanced mathematical models developed by Primetals Technologies. These models ensure that the caster already at the design phase is optimized to eliminate the risk of unsteady mold level bulging.

Models for quality improvements

Having real-time knowledge of the exact temperature of any section of the continuous casting 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 the 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 slab 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 U.S.A.’s new vacuum tank degasser

1. Plant type: twin type vacuum degasser with movable vessel car and fixed and liftable cover
2. Capacity: 230 metric tons
3. Major Equipment: vacuum filter, dust catcher, set of dry mechanical pumps, and associated material handling system

Key facts: JSW Steel U.S.A.’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 U.S.A. receives new releases, upgrades, and updates on a regular basis
- The service package included in the annual license fee also features 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 U.S.A. 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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