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## Advanced pulsating spray cooling system from Primetals Technologies started up at Hyundai Steel continuous slab caster

- **DynaJet Flex system reduces appearance of corner cracks when casting advanced steel grades**
- **Highest discretization of cooling zones in width direction**
- **Pulse-width modulated cooling widens operation window with higher turn down ratio**
- **Operational cost reduction by reduced scarfing losses and air consumption**

In November 2018, the newly introduced DynaJet Flex spray cooling system from Primetals Technologies has been started up at the two-strand continuous slab casting machine CC2 in the Dangjin, Korea plant of Hyundai Steel. DynaJet Flex allows for pulse width modulated cooling, thus enabling highest discretization of cooling zones in width direction and widening the operation window with higher turn down ratios compared to cooling systems currently in use. This minimizes the appearance of corner cracks especially for advanced high-strength steels (AHSS). Consequently scarfing losses and in addition air consumption are reduced. This is the first industrial application of DynaJet Flex technology. The order for the new system for the first strand was placed in late November 2017. After a successful test, the application of the system on the second strand was ordered immediately.

Caster CCM2 has a rated capacity of 2.8 million metric tons of slab per year. It has a machine radius of 9.5 meters and a metallurgical length of 43.5 meters. Slabs are cast in a width range of 800 to 1,650 millimeters and a thickness of 250 millimeters. Hyundai Steel is producing special steels for the automotive industry, e.g. Hyundai Motors, such as AHSS of the second and third generation. Such crack sensitive steel grades require a width- adjustable secondary cooling to avoid overcooling of the slab corners. In order to adjust spray cooling in the bender area for slab width ranges from 800 to 1,650 millimeters, a 4-step margin control with the Dynajet Flex system was installed on CCM2.

Today, secondary cooling of continuous casting machines is typically equipped with air-mist nozzles to achieve a wide turn down ratio which is the highest to lowest water flow without jeopardizing the spray pattern uniformity. To prevent corner cracks the zones are additionally split into center and margin strips across the casting direction. DynaJet Flex is the new cooling system to put the discretization of cooling zones at casting machines to the next level. By using water only nozzles, which are driven with a pulse width modulated signal, it is possible to increase the turn down ratio compared to air mist systems and significantly reduce the operating costs by reduced air consumption. The system can be installed on a segment during a planned maintenance cycle. After reinserting the segment into the machine DynaJet Flex is immediately activated. From then on the segment is ready to operate and provides the drastically refined cooling control for an optimal slab temperature, both longitudinally and transversely.



DynaJet Flex pulse-width cooling system from Primetals Technologies mounted in bender zone

This press release and a press photo are available at

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