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Yield increase by hot strand coating in continuous casting of long product

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The transition to green energy and the reduction of carbon footprints in the steel industry are essential for sustainable steel manufacturing. Optimizing casting processes in steel plants can lead to substantial reductions in emissions and operational costs, aligning with the increasing demand for eco-friendly products.

In the context of the continuous casting process for billets, scale formation presents challenges such as material loss, surface damage, equipment degradation, contamination of process paths, and significant cleaning efforts. Standard solutions to mitigate these issues include high-pressure water descaling, chemical deoxidation, and the application of coatings. However, complete prevention of scale formation is not possible. These strategies are typically applied in downstream processes; however, they have not yet been extensively implemented in the Continuous Casting Machine (CCM).

This paper emphasizes strategies developed to reduce scale formation during the continuous casting process, particularly by usage of spray coating powder. The powder is applied in precisely controlled doses to the hot billet surface via dedicated spray equipment at the end of the secondary cooling zone. By contact with the hot billet the powder rapidly melts, adheres to the billet surface and forms an inertial layer preventing from steel oxidation and consequentially reducing new scale formation.

For various applications and steel grades powders have been specifically developed. The tests have successfully been conducted at different steel plant installations, demonstrating their remarkable efficiency in reducing the oxidation rates and scale formation. The integration of this newly developed technology contributes significantly to cost savings, as it increases yield, improves product quality and reduces necessary downtimes for maintenance and cleaning. Consequently, the overall plant operational efficiency and competitiveness in the metals industry market can be enhanced by this new application in the continuous casting process.

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