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# Enhancing the Quality of Continuously Cast Products: Optimized Caster Design and Process Tuning for High-Quality Blooms

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Achieving the highest quality standards in steel casting is essential to maintain competitiveness in an increasingly demanding market. High-end steel grades require minimal inclusions, superior internal soundness and defect-free surfaces - goals that can only be achieved through meticulous design, advanced technologies and precise optimisation of operating practices.
This article undertakes a comprehensive examination of the impact of caster design and practices optimisation through three case studies: a caster for high-end wire and bar production, an upgraded caster with mechanical soft reduction, and a flexible combi-caster for billets, rounds, and heavy blooms equipped with M-EMS, F-EMS and soft reduction as well. The analysis highlights key technological advances, including a vertical bending design for improved cleanliness, and electromagnetic stirring and soft reduction techniques for improved internal quality.
Across these plants, the paper provides insights into the application and optimisation of electromagnetic stirring (M-EMS and F-EMS) and soft reduction, detailing the parameters used and the results achieved. It also provides a comparative analysis of the different cases, highlighting how design choices and process parameters influence the quality of the final product. By examining these case studies, this article reinforces the critical role of advanced design and process optimisation in maintaining a competitive edge in the steel industry.

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