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Integrated Smart Solutions for the Modern Continuous Casting Process

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ABSTRACT

In the pursuit of efficiency and cost-effectiveness, the steel industry must integrate innovative solutions to maintain high-performance standards while delivering competitive pricing. Integrated smart solutions are becoming crucial for modern steelmaking as they redefine traditional offerings by providing new functionalities, connectivity, improved reliability, enhanced utilization, and expanded capabilities. This paper examines recent advances and the integration of intelligent products within the continuous casting process for high-grade steel manufacturers, demonstrating their transformative impact on the steel production of tomorrow. The goals and benefits of integrating such smart products and solutions into the continuous casting process will be presented in detail through recent development activities by the SMS Group.

Keywords: Smart Technologies, Mold Oscillation, Condition Monitoring, Lifecycle Management, Secondary Cooling, AirMist Technology, Energy Efficiency, Scale Reduction, Yield Optimization

INTRODUCTION

The degree of digitalization becomes a pivotal factor in today's steel industry as the equipment used in continuous casting machines is undergoing a transformative process to keep up with Industry 4.0 standards. Machine components, which were historically simply regarded as mechanical or electrical hardware, are nowadays evolving into complex systems integrating sensors, data storage capabilities, microprocessors, software, and connectivity. This integration offers new opportunities to analyze and correlate the relationships between process parameters, equipment conditions, performance and product quality. The fast progress in processing power, device miniaturization, network availability and wireless connectivity has accelerated the development of smart, connected products and intensified the competition at volatile market conditions.

Smart, connected products rethink traditional product boundaries by providing exponentially expanding opportunities for new functionalities, improved reliability, enhanced product utilization and increased capabilities. Furthermore, the evolving nature

