

CASE STUDY

AMETEK LAND HELPS METALS INDUSTRY PLANT DESIGNER INCREASE TAPPING SYSTEM SAFETY AND CONTROL

INTRODUCTION

AMETEK Land, world-leading manufacturer of instrumentation and analysers for non-contact industrial infrared temperature measurements, joined forces with Danieli & C. Officine Meccaniche S.p.A. to develop advanced automatic tapping systems aimed at enhancing operational safety and process control in steel plants.



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ABOUT THE CUSTOMER

Based in Buttrio, north-east Italy, Danieli & C. Officine Meccaniche S.p.A. (Danieli) is one of the world leaders in the production of steel plants. Established in 1914, Danieli specialises in designing plants, and manufacturing and installing machinery for the metals industry. Its comprehensive expertise spans the entire production cycle from raw ore to finished steel products.

THE CHALLENGE

Steel plants face several challenges during the tapping process. Traditional tapping methods expose operators to hazardous environments, while ensuring consistent steel quality and reducing slag carryover requires precise monitoring and control. Inefficient tapping processes can lead to higher slag depths and increased downstream processing costs.

Danieli was looking to produce an automated tapping system which would make it possible to execute a complete furnace tapping remotely from the main pulpit of a steel plant. The system was intended to start furnace tilting in automatic mode, controlling the furnace position during the complete tapping process.



THE SOLUTION

Danieli partnered with AMETEK Land, leveraging its 75 years of experience in steel industry applications, to create the Danieli Automatic Electric Arc Furnace (EAF) Tapping System.

This innovative system enables complete remote furnace tapping from the main pulpit of a steel plant, significantly improving safety and control during the tapping process.

Embedded within the system are two thermal imaging systems from AMETEK Land. The first is the world-renowned Slag Detection System (SDS-E), branded as Danieli's Q-Slag.

The second is the near-infrared (NIR) fixed thermal imager that is an integral part of the Ladle Level Detection (LLD) system. These thermal imaging systems are used in conjunction with Danieli software to control steel flow in real time.

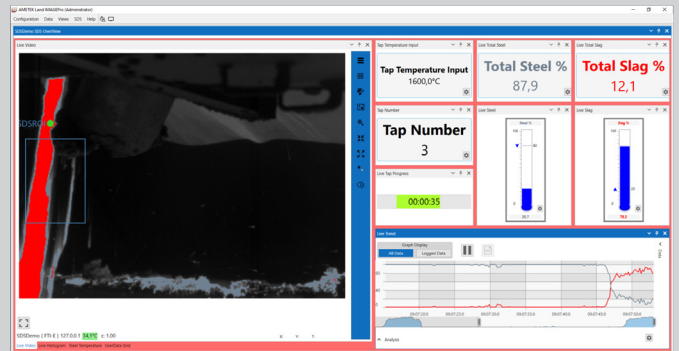
Q-Slag makes use of an SDS-E imager to detect the transition between steel and slag. It also quantifies the amount of slag that may pass into the ladle.

This is critical information for fine-tuning alloys and lime additions for the secondary metallurgy. In parallel with Q-Slag, the LLD system controls when steel inside the teeming ladle has reached pre-set level positions.

Back tilting can be done either in automatic mode (when the pre-conditions regarding steel level and weight are met) or by remote intervention of the EAF operator from the main pulpit.



AMETEK Land near-infrared (NIR)



AMETEK Land's Slag Detection System

THE RESULTS

The partnership between AMETEK Land and Danieli successfully addressed critical challenges in steel production by enhancing safety, process control, and efficiency through innovative automated tapping systems.

AMETEK Land's Slag Detection System has been demonstrated to improve operator response times and steel consistency at the end of each tap. Those improvements typically result in up to a 25% reduction in slag depths, compared with traditional methods of stream monitoring.

"We are delighted that Danieli selected AMETEK Land as a partner on their Automated Tapping System," said David Primhak, Division Vice President and Business Manager.

"There are major benefits for steel producers of using this technology. Fast slag detection response allows plants to significantly reduce slag carryover, resulting in improved yields, higher quality steel, and a reduction in costly downstream processing."



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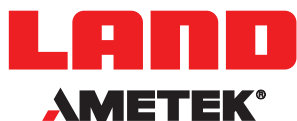
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