

Innovative integration of high precision laser measurements, artificial intelligence based surface analysis and predictive process models towards greener steel processing (InToSteel)

Abstract:

The project is a joint effort by Sapotech and Evertz to develop next generation abilities to improve the metallurgical processes of continuous casting and steel grinding, greatly exceeding the current state-of-the-art and enabling more sustainable processing. For continuous casting, novel automated process control methods are invented through integration of phenomena based heat transfer models, predictive machine learning and deep learning surface inspection analysis. The integrated solution ultimately enables real time and predictive assessment of the continuous casting and grinding processes, ultimately enabling full automation of the processes.

Countries involved



Application sectors

Industrial components

Research and innovation domains

Advanced manufacturing processes, Smart & adaptive manufacturing systems, Digital, virtual and efficient companies, Person-machine collaboration

Total cost in M€ (millions)

2.3 M€

Starting date

01/10/2025

Duration (in months)

36 months



Project leader

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Project participants

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Evertz Europe SA

RATIONALE OF THE PROJECT

Today, customers are increasingly looking to find surface inspection solutions that adapt to their different needs. InToSteel project addresses directly the challenges of assessing and predicting the surface quality of continuously cast and ground steel by integrating multi-disciplinary technologies.

TECHNOLOGICAL INNOVATION, ACHIEVEMENTS AND RESULTS

The goal is to achieve automatic AI assisted control of metallurgical processes based on high precision 3D laser measurements, DNN based surface analysis, phenomena based heat transfer models and predictive machine learning in order to advance the SoA as measured by throughput speed, time, quantity of scrap, and defect resolution accuracy / quality for both grinding and continuous casting processes.

MARKET POTENTIAL

In the EU the steel consumption is estimated to start growing in 2024 and a similar trend is expected to continue in the global steel demand. There are estimated 1000 steel mills globally, majority of them equipped with a continuous caster and most of them being a potential customer for grinding service providers like Evertz. Each of the steel mills is a potential customer for Sapotech. Sapotech has the potential to sell anywhere within 1 to 20 solutions to each of these customers with potential 1M€ per annual recurring revenue (ARR) as-a-service. This depicts the global ARR potential of 1000M€ for Sapotech products. For Evertz the potential grinding service market can be calculated as a percentage (20-25%) of the amount of steel produced. The exact % for each potential steel mill / grinding site and sector depends on the specific steel grades and end user applications. The current estimate of the grinding market potential is between 500-1500M€ ARR.

IMPACT POTENTIAL

The project reinforces the competitiveness of European Steel. While using the relative strengths of Europe in AI and SW engineering to gain competitive advantage. Given the project's cross-industrial nature it closes gaps in the implementation of European manufacturing value-chains. The project will reduce the cost of steel manufacturing, advances the steel industry a significant step towards the promise of zero defect manufacturing and enables sustainability advances throughout the value-chain.