

INTERFACE: Digital and Low-Carbon Steel Reheat Furnace - INTERFACE

Description

INTERFACE is aligned with the goals of digitalization and decarbonization of the metallurgical sector and proposes innovative solutions based on advanced software generation and use of data-driven methods with Machine Learning to develop digital tools for the system control and optimization. INTERFACE is dedicated to develop digital tools and a data acquisition system to adapt the furnace heating capabilities from natural gas to hydrogen and reduce the fossil fuel dependency and carbon footprint in a reheat furnace from CELSA.

INTERFACE proposes a multidisciplinary approach based on the development of physics-based and data-based models of the furnace operation on different scenarios according to the hydrogen content and burner operation. High-fidelity models that can describe the reheating process from component to system level will be used to better understand the thermochemical conditions of the furnace and the requirements to the power generation units. Furnace sensing and instrumentation will be used to cross-validate the results of the numerical simulations and provide additional data to develop low-order models with data-driven methods based on Machine Learning. A Digital Twin of the furnace including fuel effects will be generated from physical models, sensor data and Machine Learning that can be used to provide rapid-response in activities of design, control or maintenance.

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