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Optimization of scrap mix in EAF steelmaking

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A numerical model for the estimation of main variables in Electric steelmaking is presented. The multiplicity of phenomena occurring in the EAF together with the huge number of variables and their complex interaction, prevents the development of a reliable online application able to take direct action on the process. An alternative approach in which the overall average performance of the EAF after a period (a week, a month) is considered instead. By performing mass/energy balances over a certain period, this strategy allows to estimate how much consumables (electrical energy, electrodes, oxygen, fluxes) are required to operate the furnace for a given scrap mix and target liquid steel production. In this way the transformation cost of the material loaded in the furnace can be computed. Particularly, the impact of adding a new material in the overall cost can be established.

The model has been tuned to represent the six EAFs of Tenaris and is used by technologists, industrial planning staff and cost analysts of five different steel shops. It was implemented in a web application, making it available for all users.

Primary authors: CICUTTI, Carlos (Tenaris); MARCHINI, Fabio (Tenaris); GALBIATI, Paolo (Tenaris); FERRO, Sergio Pablo

Presenter: FERRO, Sergio Pablo

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