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# DRI/SCRAP blending in EAF practice. Impacts on slag composition, energy consumption and furnace productivity

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The net zero emission target for steelmaking is pushing toward the adoption of breakthrough technology. The process route based on iron ore pellets direct reduction requires also a fine tuning of the subsequent melting step in EAF. This, in turn, will require the adoption of modified operating practices, tailored to the EAF input charge of materials.
The blending of DRI and scrap is a way to compensate for the increased energy demand required by DRI melting. The ratio DRI/scrap will depend on the required steel quality, the plant productivity needs, the energy demand, and the quality of input pellets. Anyhow, the adoption of hybrid EAF practices will impact on slag composition & chemistry, because scrap reduces Si, S, P from high-P DRI and lowers slag volume, minimizing limestone/fuel additions.
DRI contains FeO (linked to an endothermic reaction) and gangue (mainly composed by $SiO_2$). On the other hand, melting requires more electricity and lime, increasing slag and heat loss. As a result, optimal blend approaches require a deeper understanding of the occurring phenomena (e.g foaming, refractory erosion and P removal).
The presented work is based on activities at the EAF pilot plant (7t capacity), installed in the frame of the IPCEI HYDRA project, which offers a testing scenario for such metallurgical challenges induced by DRI use. In particular, the work is focused on the results of pilot trials with variable amounts of scrap/DRI blending (from 100% scrap to 100% DRI). The results analysis is supported both by thermodynamic codes use to describe slag modification and a proprietary EAF model.
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