POSTER EXPOSITION

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Poster 13

The influence of cooling rate during solidification on segregation behaviour in low alloy steels with and without residual elements

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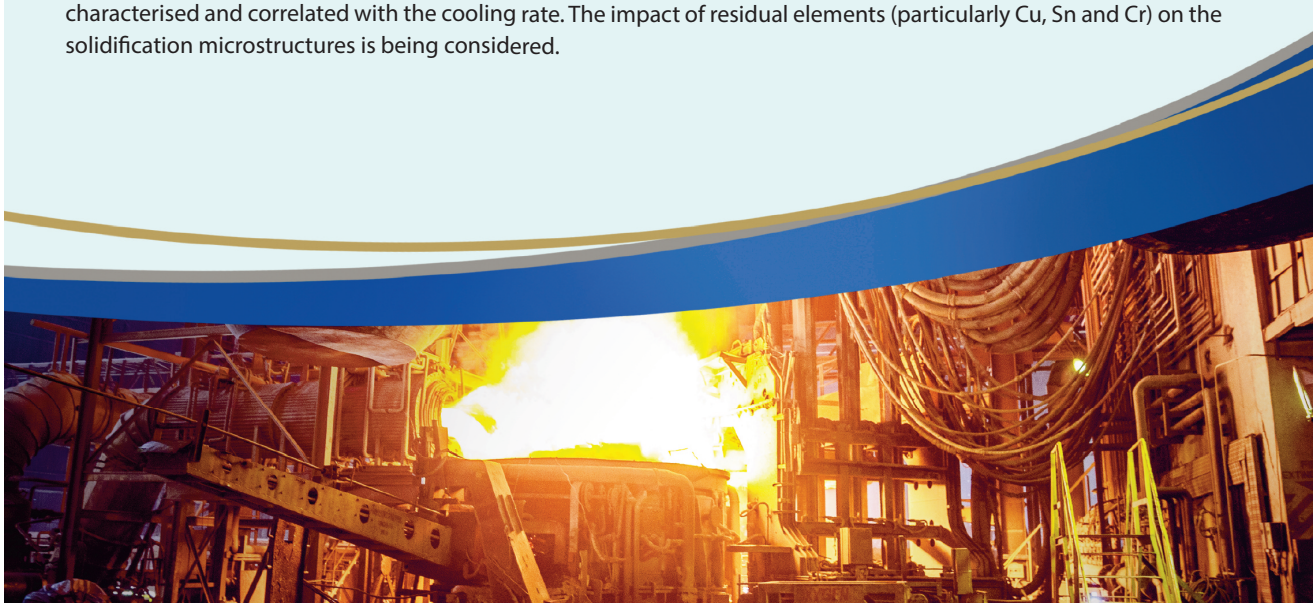
ABSTRACT:
Next generation casting technologies, for processing to strip steels, such as thin slab, belt or strip casting have gained popularity due to the reported energy saving, which can be as high as 1.6 GJ/tonne when compared to conventional thick slab casting. However, these casting approaches result in changes in the cooling rate during solidification, influencing as-cast segregation which may have a knock-on effect on the final microstructure and properties.

A COMSOL multi-physics model has been used in the design of a wedge mould that gives the range of cooling rates representative of belt, thin and thick slab casting. The wedge mould has been used to cast a low alloy structural steel and the as-cast microstructure (secondary dendrite arm spacing and interdendritic levels for Mn have been characterised and correlated with the cooling rate. The impact of residual elements (particularly Cu, Sn and Cr) on the solidification microstructures is being considered.



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