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Thermal simulation of the steel solidification during continuous casting

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ABSTRACT

In most parts of a continuous steel casting, the heat transfer is, in effect, one-directional, so the solidification of billet or slab can be considered a locally-stabilized unidirectional process. Based on the similarity of heat conduction, we have engineered a thermal simulation method to simulate the continuous casting process. The device uses the horizontal unidirectional solidification method to simulate the solidification of a unit in continuous steel billet or slab. By controlling the temperature gradient and stretching rate of furnace, to achieve the liquid temperature gradient and dendrite growth rate in continuous casting. The effect of pouring temperature, cooling intensity and stirring on solidification of stainless steels was investigated on this device. The results showed a low pouring temperature and weak cooling intensity is benefit to reduce the proportion of columnar grain zone.