

The Heat Flux and the Effects of Mould Shape on Distortion of the Mould in a Thin Slab Caster

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Geometrically, there are two kinds of mould to achieve high-speed casting: funnel-shaped and parallel mould. The mould shape and high casting speed leads to higher mould temperatures and shorter mould life than in conventional slab casters. Mould wall temperature measured in the plant was analyzed to determine corresponding the heat-flux profiles in thin slab moulds using an Convective Inverse Heat Conduction model, and this data was then used in an elastic-visco-plastic analysis to investigate the deformation of the moulds in service for different the mould shapes. The model predictions of temperature and distortion during operation match plant observations. During operation, the hot face temperature reaches 440-445°C and the copper plates bend toward the steel, with a maximum outward distortion of about 0.31-0.33mm. This occurs just above the center of the wide faces, and is smaller than the distortion of a conventional slab mould.