

Temperature Control in Tundish by Combined Reactor Models for Energy Efficient Processing of Liquid Steel

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Abstract: *Tundish plays an important role for continuous casting of steel by controlling the superheat temperature at the tundish outlet or in the concast mold. Superheat temperature is maintained in a narrow range to achieve quality and productivity, since high superheat leads to slower casting rate and higher segregation, whereas low superheat leads to irregular flow and nozzle blockage. Therefore liquid steel flow and thermal condition must be controlled accurately for smooth and consistent operation. Tundish flow and thermal profile can be obtained by 3D CFD simulation. However, CFD simulations for tundish have high computational time and cannot be used for on-line process control. Therefore flow in tundish is evaluated by combining reactor models like Plug Flow Reactor (PFR), Completely Stirred Tank Reactor (CSTR) and Dead zone. The combined reactor model is compared with experimental and plant data published in literature.*

Keywords: Tundish, Reactor model, Superheat Temperature, Casting rate, Process control

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