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Simulation of the Extensional Flow Mixing of Molten Aluminium and Fly Ash Nanoparticles

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Abstract : This study presents simulations of an aluminium melt containing an initially non-dispersed fly ash nanoparticle phase. Mixing is affected predominantly by means of forced extensional flow via either straight or slanted orifices. The sensitivity to various process parameters is determined. The simulated process is used for the production of cast fly ash-aluminium nanocomposites. The possibilities for rod and plate stock grading in the context of a continuous casting process implementation are discussed.

Keywords : metal matrix composites, fly ash nanoparticles, aluminium 2024, agglomeration
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