

Numerical Simulation of Solidification Processes. Application for Aluminum Vertical Continuous Castings

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Abstract: The energy equation describing the heat transfer processes (Fourier equation) and 2nd boundary condition ($-l.gradT(X, t) = qn(X, t)$), which was determined by simulating experiment, were used to calculate the temperature field of vertical continuous casting process. The Finite Difference Method (FDM) with explicit scheme was applied. The calculating process was much simplified for the cylindrical bar, since in this case one deals with 1D problem. The results are developed for optimization of the technological parameters. The practical applications are made for some high-strength aluminum alloys, such as 6063, 2024, 7075. 7015 in an army company: some modification of the technological process, transferred from abroad, is introduced, giving high-qualified product.

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