

Progress of some techniques on electromagnetic metallurgy

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TOPIC : Advanced materials processing in static or alternating magnetic field

Abstract: The research activities on electromagnetic metallurgy with different magnetic field in Northeastern University of China are overview, which is focus on four techniques. 1) Progress of vertical EMBr (V-EMBr) in continuous casting since it is firstly put forward in EPM2009 conference[1]. V-EMBr brings some different effects with Ruler-EMBr and FC-Mold on the control of fluid flow. 2) Process of vertical continuous casting of nickel-based superalloy with electromagnetic stirring (EMS) instead of ingot casting mode. The surface and internal quality of strands have greatly improved as applied different electromagnetic fields on the mould and second cooling zone of continuous casting machine. 3) Process of thermal simulation experiment on fluid flow in mould with a circular flow system of Pb-Sn-Bi alloy with DC magnetic field. The behaviours of argon gas bubbles and fluctuation of melt surface are investigated with and without magnetic fields. 4) Process of fabrication of high-strength and high-conductivity copper alloys with high magnetic field and electromagnetic stirring. The influence of magnetic fields on its microstructure, strength and conductivity are presented.

Keywords: EMBr; Fluid flow; Continuous casting; EMS; Superalloy; Solidification; Cooper alloy; High magnetic field;

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References

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