



Effects of Mould Vibration on Casting Characteristics of Al-6wt%Cu Alloy

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ABSTRACT

Metal casting is one of the most important manufacturing processes in which liquid metal is poured into the mould cavity and allows cooling or solidifying in that cavity. The quality of casting depends on the flow behaviour of molten metal and other process parameters. The properties of casting depend on the microstructure after solidification. Therefore, in order to get better structure in the solidified casting mould vibration during pouring and till solidification or in another word mould vibration, casting is one of the latest technique to produce casting with better morphology, surface finish, reduced amount of shrinkage and less chances of hot tear. In this research work, experimentation with mould vibration in order to alter the as-cast microstructure of cast components of Al-6wt%Cu was carried out for different values of wavelengths at a fixed pouring temperature. This work was carried out in two parts. First part involved casting the alloys without vibrating the mould and establishing the benchmark for castability, mechanical properties, and microstructure. This benchmark was used for comparison with corresponding information obtained in Part two where similar castings were made while the mould was mechanically vibrated. Part two involved casting the Al-6wt%Cu alloy while the mould is mechanically vibrated with pre-determined vibration parameters. The microstructure and mechanical properties obtained after the vibrating mould casting were compared with the benchmark obtained from the result of part. It was found that due to vibration causing grain refinement and better mechanical properties compared to without vibration casting.

Keywords: Mould Vibration, Castability, Microstructure.