

Effect of the Mould Rotational Speed on the Quality of Centrifugal Castings

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Abstract

Centrifugal casting is a standard casting technique for the manufacture of hollow, intricate and sound castings without the use of cores. The molten metal or alloy poured into the rotating mold forms a hollow casting as the centrifugal forces lift the liquid along the mold inner surface. The rotational speed of the die was suggested to greatly affect the manner in which the molten metal flows within the mould and consequently the probability of the formation of a uniform cylinder. In this work the flow of the liquid metal at various speeds and its effect during casting were studied. The results suggested that there was a critical range for the speed, within which the produced castings exhibited best uniformity and maximum mechanical properties. When a mould was rotated at speeds below or beyond the critical range defects were found in the final castings, which affected the uniformity and significantly lowered the mechanical properties.

Keywords: centrifugal casting, rotational speed, critical speed range, mechanical properties.