

THE EFFECT OF SAND CASTING PROCESS PARAMETERS ON MECHANICAL PROPERTIES OF ALUMINUM ALLOY CASTING

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ABSTRACT

The effect of runner size, mould temperature, and pouring temperature on the mechanical properties of aluminum alloy part produced through sand casting was investigated. Aluminum alloy scraps of known specification were sourced locally and recycled into cylindrical shapes in a sand mould. Azare foundry sand was used for the production of moulds. The effect of the runner size was studied by tapering the size of the runner towards the mould cavity. The reduced cross-sectional area of the runner is considered. The prepared mould was pre-heated within a temperature range of 25—230⁰C. However, pouring temperature was varied within the range of 700—850⁰C. The mechanical properties' aluminum alloy castings studied were hardness, impact and tensile strength. The results showed that the selected process parameters significantly influence the mechanical properties of the aluminum alloy casting. The results of this study can be employed as input data in sand casting process, which is one of commonest manufacturing methods being practiced in developing countries; so that the high volume of the defective castings usually produced will be reduced, thereby making the process less expensive.

KEYWORDS: Sand Casting Process Parameters, Mechanical Properties, and Aluminum alloy