

Effect of Process Parameters on Tensile Strength of Aluminum Alloy ADC 10 Produced through Ceramic Shell Investment Casting

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Abstract : Castings are produced by using aluminum alloy ADC 10 through the process of Ceramic Shell Investment Casting. Experiments are conducted as per the Taguchi L9 orthogonal array. In order to evaluate the effect of process parameters such as mould preheat temperature, preheat time, firing temperature and pouring temperature on surface roughness of ceramic shell investment castings, the Taguchi parameter design and optimization approach is used. Plots of means of significant factors and S/N ratios have been used to determine the best relationship between the responses and model parameters. It is found that the pouring temperature is the most significant factor. The best tensile strength of aluminum alloy ADC 10 is given by 150 °C shell preheat temperature, 45 minutes preheat time, 900 °C firing temperature, 650 °C pouring temperature.

Keywords : investment casting, shell preheat temperature, firing temperature, Taguchi method

Conference Title : ICFTFNC 2018 : International Conference on Foundry Technology, Ferrous and Non Ferrous Castings

Conference Location : San Francisco, United States

Conference Dates : November 26-27, 2018