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Examining the Effects of Production Method on Aluminium A356 Alloy and A356-10%SiCp Composite for Hydro Turbine Bucket Application

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Abstract : This study investigates the use of centrifugal casting method to fabricate functionally graded aluminium A356 Alloy and A356-10%SiCp composite for hydro turbine bucket application. The study includes the design and fabrication of a permanent mould. The mould was put into use and the buckets of A356 Alloy and A356-10%SiCp composite were cast, cut and machined into specimens. Some specimens were given T6 heat treatment and the specimens were prepared for different examinations accordingly. The SiCp particles were found to be more at inner periphery of the bucket. The maximum hardness of As-Cast A356 and A356-10%SiCp composite was recorded at the inner periphery to be 60 BRN and 95BRN, respectively. And these values were appreciated to 98BRN and 122BRN for A356 alloy and A356-10%SiCp composite, respectively. It was observed that the ultimate tensile stress and yield tensile stress prediction curves show the same trend.

Keywords : A356 alloy, A356-10%SiCp composite, centrifugal casting, Pelton bucket, turbine blade
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