

Mold Variations Using Lapindo Mud As A Binding Material For Lumajang Sand In Aluminum Castings From Used Pistons For Impact and Microstructure Tests

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ABSTRACT

Metal casting is a process where hot molten metal is poured into a mold that has a cavity with the desired finished shape and is allowed to cool to form a solidified part. Sand casting is a casting method that used sand as the molding medium. The alternative sand and binder used is Lumajang sand and Lapindo mud in addition to silica sand and bentonite. This research aims to determine the influence of variations in the mixture between Lapindo mud and Lumajang sand on metal casting. Variations in the composition of the molds used, namely composition 1 (77% Lumajang sand, 13% Lapindo mud, 10% water), composition 2 (74% Lumajang sand, 16%, Lapindo mud, 10% water), and composition 3 (71% Lumajang sand, 19% Lapindo mud, water 10%). The result obtained from this research are as follows, the composition of 1 cast specimen produces an impact energy strength of 0.00244 J/mm² and the microstructure has a grain percentage of 31.74% with a grain boundary of 68.26%, the composition of 2 cast specimens produces the impact energy strength is 0.00664 J/mm² and the microstructure has a grain percentage of 40.96% with grain boundaries of 59.04%, and the composition of 3 cast specimens produces an impact energy strength of 0.01331 J/mm² and the microstructure has a grain percentage of 56.83% with an item limit of 43.17%. from the result obtained, it can be concluded that the greater the percentage of Lapindo mud used as a binding material, the stronger the impact energy and the percentage of granules produced in the casting. The best molding composition was obtained by the 3 molding composition, which had the highest impact energy and grain percentage compared to the other molding compositions.

Keywords : Metal Casting, Lumajang Sand, Lapindo Mud, Charpy Impact Testing, Microstructure Testing