

**COMPARISON OF THE EFFECTIVENESS OF SILICA SAND WITH SEMERU VOLCANIC SAND AS A MOLD IN Al-Si CASTING WITH LAPINDO MUD BINDER ON HARDNESS AND BENDING TESTS**

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**ABSTRACT**

*Factors that determine the quality of products resulting from sand casting are sand specifications, binder materials and the percentage of mold composition. Materials that have not been widely used for molds and binders are volcanic sand and Lapindo mud. Silica sand was chosen because it has a high silica content, which serves to prevent damage due to mold collapse. This study aims to determine how the effect of variations in the composition made from silica sand, volcanic sand, and Lapindo mud in sand mold casting on the quality and yield of castings. The test was carried out at the Materials Testing Laboratory, Brawijaya University, Malang. Variations of the mold composition used are composition 1 (73% silica sand, 17% Lapindo mud, 10% water), composition 2 (73% volcanic sand, 17% Lapindo mud, 10% water), composition 3 (54 silica sand, 75%, 18.25% volcanic sand, 17% Lapindo mud, 10% water, composition 4 (54.75% volcanic sand, 18.25% silica sand, 17% Lapindo mud, 10% water). The hardness test results for the Al-Si casting specimens obtained an average value for composition 1 of 34.5 HRA, composition 2 of 31.2 HRA, composition 3 of 33.1 HRA, and composition 4 of 32 HRA. The results of the bending test for Al-Si casting specimens obtained an average value for composition 1 of 339.38 MPa, composition 2 of 375 MPa, composition 3 of 352.5 MPa, and composition 4 of 363.75 MPa. In the bending test results, the casting results for the second mold composition, the casting specimens are ductile compared to the specimens for the first mold composition. So it can be concluded that when using silica sand, the hardness results are high and when using volcanic sand, the bending results are high.*

*Key words : Sand Mold Casting, Al-Si Alloy, Mold Composition Variation, Rockwell Hardness, Bending Test.*