

**UTILIZATION OF MOUNT SEMERU VOLCANIC SAND AS A  
MOLDING SAND AND LAPINDO MUD AS A BINDER IN USED  
ALUMINUM PISTON CASTINGS WITH VARIATIONS IN  
COMPOSITION ON HARDNESS AND BENDING TESTS**

*Mentor Faruq Avero Azhar, S.ST., M.Eng.*

**Firdana Hendrianto**

*Study Program of Automative Engineering  
Majoring of Engineering Jember State Polytechnic*

**ABSTRACT**

*The product quality of the sand mold casting process is influenced by the sand specifications, binder material, and mold composition. Materials that have not been widely used for molding and binding include volcanic sand and Lapindo mud. In this research, molds made from these two materials were used. Several mixtures of materials were used as molds and binding materials in this research, namely Mount Semeru volcanic sand, Lapindo mud, water. The composition variations used in this research include Composition 1 Mount Semeru Volcanic Sand 77%, Lapindo Mud 13%, Water 10%, Composition 2 Mount Semeru Volcanic Sand 74%, Lapindo Mud 16%, Water 10%, Composition 3 Mount Semeru Volcanic Sand Semeru 71%, Lapindo Mud 19%, Water 10% and used used pistons as melted material. Brinnel hardness test results for composition 1 with an average value of 50.8 HBW, composition 2 with an average value of 44.3 HBW, composition 3 with an average value of 42.5 HBW. For the bending test value, composition 1 has an average value of 186 MPa, composition 2 has an average value of 238.5 MPa, composition 3 has an average value of 259.125 MPa. From the results obtained, it can be concluded that the greater the percentage of Lapindo mud as a binder, the results of the hardness test decrease, while the greater the percentage of Lapindo mud, the results of the bending test increase.*

**Keywords:** *Sand mold casting, Mount Semeru Volcanic sand, Lapindo Mud, Used Pistons, Mold Composition Variations, Brinnel Hardness Testing, Bending Testing.*