EXPERIMENTAL STUDY THE EFFECT OF MERANTI WOOD POWDER ADDITION ON THE CHARACTERISTICS OF MOLDING SAND AND POROSITY DEFFECT OF ALUMINIUM 6061 CASTING PRODUCT

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ABSTRACT

Following with the development of technology, the need of equipment made from aluminium is increase. One of the most widely use method of casting is sand casting. Research to improve sand casting product quality is still developed. One way to improve the quality of sand mold is by addition of additives. The aim of this research is to know the effect of adding meranti wood powder to the characteristics of molding sand and the porosity defects of aluminium casting product.

This research is using 9 variations of molding sand composition with the main material are silica sand, bentonite, and water. The composition of bentonite and water in the molding sand was kept constant at 8% and 4%. Meranti wood powder is used as a substitute for silica sand. Molding sand compositions are varied by addition of wood powder at 0% to 8%. Molding sand characteristics such as permeability and compressive strength are determined by using standard specimen. Standard specimen made by using standard tube. The compositions of molding sand that use to be sand mold are molding sand without additive, addition 1% and 8% of meranti wood powder. The pattern of casting product is a cuboid that have 50mm of length, 50mm of width, and 12mm of high. Aluminium casting is done after the sand mold was dried. Mold sand surface and casting
product surface are observed after the casting process. Then the porosity defects of casting product are measured.

The result of this research, molding sand with 1% addition of meranti wood powder have the highest permeability number (176cm³/minute) while the lowest permeability number (57.67cm³/minute) was the molding sand with 8% addition of meranti wood powder. The addition of meranti wood powder less than 2% will increasing the permeability number of molding sand. Molding sand with 8% addition of wood powder have the lowest compressive strength (130KN/m²) while the highest compressive strength (366,67KN/m²) was the molding sand without addition. The addition of meranti wood powder will decrease compressive strength of molding sand. Every 1% additional of wood powder will decrease compressive strength more than 10%. The addition of meranti wood powder more than 2% will decrease the permeability and compressive strength. Based on the porosity test showed that the lowest percentage of porosity occurs in the casting mold without addition. While the highest percentage of porosity was the casting product from sand mold with 8% addition of wood powder.

**Keyword:** Meranti wood powder, Permeability, Compressive strength, Porosity