

ABSTRAK

Penelitian ini bertujuan untuk menanamkan pengaruh penambahan bentonit sebagai pengikat pada pasir cetak Bengawan Solo terhadap karakteristik mekanisme cetakan, termasuk kekuatan tekan, kekuatan tarik, dan permeabilitas. Metode penelitian ini menggunakan metode eksperimen. Data diperoleh dengan cara mengukur besarnya nilai permeabilitas dengan alat Permeability Tester, sedangkan nilai kekuatan tekan dan kekuatan tarik diukur dengan *Universal Strength Machine*. Variasi penambahan bentonit yang diuji adalah 0 gram, 25 gram, 50 gram, dan 75 gram pada campuran pasir Bengawan Solo dengan pasir silika. Pengujian dilakukan dengan metode uji kekuatan tekan, kekuatan tarik, serta uji permeabilitas untuk menilai kemampuan pasir cetak dalam mempertahankan struktur cetakan selama proses pengecoran logam. Hasil penelitian menunjukkan bahwa penambahan bentonit secara signifikan meningkatkan kekuatan tekan dan tarik, terutama pada kadar 25 gram dan 50 gram, sedangkan permeabilitas cenderung menurun seiring dengan peningkatan kadar bentonit. Hasil pengujian kekuatan tekan terbesar 24,7 psi, hasil pengujian kekuatan tarik terbesar 1,33 psi, dan hasil pengujian permeabilitas terbesar 209,380 ml/menit.

Kata kunci: Pengecoran Logam, pasir cetak, bentonit, kekuatan tekan, kekuatan tarik, permeabilitas.

ABSTRACT

This research aims to investigate the effect of bentonite addition as a binder in Bengawan Solo casting sand on the mold's mechanical properties, including compressive strength, tensile strength, and permeability. The research utilizes an experimental method. Data were obtained by measuring the permeability values using a Permeability Tester, while the compressive and tensile strengths were measured using a Universal Strength Machine. The bentonite addition variations tested were 0 grams, 25 grams, 50 grams, and 75 grams, in a mixture of Bengawan Solo sand and silica sand. Testing was conducted through compressive strength, tensile strength, and permeability tests to assess the ability of the casting sand to maintain mold integrity during the metal casting process. The results indicate that the addition of bentonite significantly improves compressive and tensile strengths, especially at 25 grams and 50 grams, while permeability tends to decrease as the bentonite content increases. The highest compressive strength recorded was 24.7 psi, the highest tensile strength was 1.33 psi, and the highest permeability result was 209.380 ml/min.

Keywords: Metal Casting, molding sand, bentonite, compressive strength, tensile strength, permeability.