Testing for Green Compression Strength and Permeability Properties on the Tailing Sand Samples Gathered from Ex Tin Mines in Perak State, Malaysia

Abstract:
Permeability and green compression strength are among the important mechanical properties and considered much in the sand casting mould preparation. These molding sand properties play a vital role in determining the optimum moisture content for making green sand casting mould. Tailing sand is the residue mineral from tin extraction, which contains between 94% and 99.5% silica and in abundance in Kinta Valley of state of Perak, Malaysia. In this research work, samples of tailing sands were gathered from four identified ex tin mines located at the Perak State, Malaysia. They were investigated by the standards and testing procedures prescribed by the American Foundrymen Society (AFS). Sand specimens of size Ø50 mm×50 mm in height from various sandwater ratios bonded with 4% clay were compacted on applying three ramming blows of 6666 g each by using a Ridsdale-Dietert metric standard rammer. The specimens were tested for green compression strength using Ridsdale-Dietert universal sand strength machine and permeability number with Ridsdale-Dietert permeability meter. Before the tests were conducted, the moisture content was measured using moisture analyzer. Samples with moisture content ranging from 3 to 3.5% were found to have optimum working range with effective green compression strength and permeability.