Substitution of Rice Husk Ash for Grout Additive to Decrease Shrinkage of Cement Grouting

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Rice husks are the protecting covering of grains of rice. They are formed from hard materials, including opaline silica and lignin, to protect the seed during the growing season. Rice milling industry generates substantial amounts of rice husk during milling of paddy, which is mostly used as a fuel in rice milling industry. Rice Husk Ash (RHA) is about 25% by weight of rice husk when burnt in boilers. Chemicals used in grouting may be replaceable with waste material from the rice milling industry when it is processed to RHA to decrease the shrinkage while increasing the strength. This study aims to substitute RHA as a grout additive in cement grouting and identify an optimum amount of RHA. First rice husk was burnt in a muffle furnace under controlled temperature which started at room temperature and was gradually increased up to 680 ℃ for about 6 hrs before it was allowed to cool down to room temperature (25 ℃). RHA sample was sieved by using 150 µm sieve. The cement: grout additive: water mixing ratio 2000:9:840 respectively. Then RHA was added replacing varying amounts of grout additive. The grout mixture was prepared manually by hand since the samples were too small to mix using a mixing machine. The proto type samples made were passed the strength tests according to the British Standard 1881. Mixing with a mixer would decrease the variation of results. According to the compressive strength, samples which contain high rice husk ash content were having a high compressive strength. Furthermore, the strength increased after 28 days was 49 MPa. Thus, the conclusion can be drawn that substitution of RHA for grout additive is possible and positive with gained strength.

Keywords: Shrinkage, Grouting, Grout additive, Rice husk ash