

Application of Metakaolin from Northeast of Thailand Used as Binder in Casting Process of Rice Polishing Cylinder

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Abstract : The objective of this research was to apply metakaolin from northeast of Thailand as a binder in the casting process of rice polishing cylinder in replacement of the imported calcined magnesite cement and to reduce the production cost of the cylinder. Metakaolin was obtained from three different regions (Udon Thani, Nakhon Phanom, and Ubon Ratchathani). The design of experiment analysis using the MINITAB Release 14 based on the compressive strength and tensile strength testing was conducted. According to the analysis results, it was found that the optimal proportions were calcined magnesite cement: metakaolin from Udon Thani, Nakhon Phanom and Ubon Ratchathani equal to 63:37, 71:29, and 100:0, respectively. When used this formula to cast the cylinder and test the rice milling, it was found that the average broken rice percent was 32.52 and 38.29 for the cylinder contained the metakaolin from Udon Thani and Nakhon Phanom, respectively, which implied that the cylinder which contained the metakaolin from Udon Thani has higher efficiency than the cylinder which contained the metakaolin from Nakhon Phanom at 0.05 level of statistical significance. Whereas, the average wear rate of cylinder from both resources were 7.27 and 6.53 g/h, respectively.

Keywords : binder, casting, metakaolin, rice polishing cylinder

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