

Thesis Title	Effect of Fineness and Chemical Composition of Fly Ashes on Heat of Hydration of Concrete
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Abstract

This thesis illustrates the study of heat hydration of fly ash concrete. The fly ashes were obtained from two sources which are fly ashes from Mae Moh and Kanchanaburi. They are differences in physical and chemical properties. In order to study the effect of their difference in size and fineness, the obtained fly ashes were classified into two sizes by using an air classifier. The cementitious materials of 350, 450, and 550 kg/m³ were used in this study. Fly ash from Mae Moh was replaced Portland cement of 20, 40, and 60 percent while that of Kanchanaburi was used to replace of 20, 30, and 40 percent by weight of cementitious materials. Both of fly ash concrete mixtures were kept water-cementitious material ratio as contents of 0.35 and 0.65 for Mae Moh and Kanchanaburi fly ashes, respectively. Concrete was cast in the mold of 35×35×35 cm with the lining of insulator of 5 cm on each size. The thermocouple was used to monitor the temperature rise due to heat of hydration over the period of 168 hours. In addition, concrete cylinders of 10×20 cm were cast to determine compressive strength of concrete at 1, 3, 7, 14, 28, 60, and 90 days.

The results showed that the higher the of cementitious material in concrete, the higher the temperature rise are observed. However, the increasing of fly ash to replace Portland cement results in the lower the temperature rise of concrete. Fly ash with high CaO is most likely to increase the temperature rise. With classified fly ash, the concrete produces higher temperature

rise as compared to the obtained fly ash. Fly ash with high Blaine fineness is most likely to give high increase the temperature rise. Superplasticizer can reduce the peak temperature of concrete, however it shifts the peak-temperature-period. The resulted showed that round shape fly ash-concret gave higher compressive strength than the irregular and high porosity fly ash concrete