Thesis Title	Effect of Rice Husk-Bark Ash and Palm Oil Fuel Ash on Compressive Strength and Chloride Penetration of Concrete
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Abstract

The objectives of this research are to study the effects of rice husk-bark ash (RHBA) and palm oil fuel ash (POFA) on compressive strength and chloride penetration of concrete. Rice husk-bark ash and palm oil fuel ash, by-products from biomass power plants, were ground until the particles retained on a sieve No. 325 of 15-20 % (medium fineness) and less than 5% (high fineness) by weight. Three different finenesses of RBHA and POFA (including RBHA and POFA as directly received from the power plants) were used to replace Portland cement type I at 10, 20, 30 and 40% by weight of binder to cast concrete. Compressive strengths of concretes were determined at the ages of 7, 28, 90 and 360 days while chloride penetration of concretes were determined at the ages of 90 and 360 days.

The results revealed that at the age of 90 days, the unground rice husk-bark ash and palm oil fuel ash were not suitable for using as a cement replacement in concrete because the concrete produced low compressive strength and high chloride penetration as compared to use of the control concrete. Additionally, with 10% and 40% replacement of Portland cement type I by medium fineness and high fineness of rice husk-bark ash, respectively, the compressive strengths of concretes were as high as that of the control concrete and the values of chloride penetration were lower than that of the control concrete at 90 and 360 days. When high fineness of palm oil fuel ash was used to replace Portland cement at 30 % by weight of binder, it produced higher compressive strength and lower chloride penetration of concrete as compared to the control concrete at 90 and 360 days. In addition, concrete containing RHBA or POFA with higher replacement of Portland cement tended to have lower chloride penetration than the one with lower replacement of Portland cement. Finally, it was found that the

chloride penetration of concrete depended not only on the compressive strength of concrete but also depends on properties of ash, fineness, and replacement of Portland cement.

Keywords : Chloride Penetration / Compressive Strength / Rice Husk-Bark Ash / Palm Oil Fuel Ash