A STUDY OF GROUND COARSE FLY ASHES WITH DIFFERENT FINENESSES FROM VARIOUS SOURCES AS POZZOLANIC MATERIALS

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The aim of this study is to evaluate the properties of ground coarse fly ashes, from five sources in Thailand, the shapes, sizes, and chemical compositions of which are completely different. Coarse fly ash was fractionated by an air classifier and ground into three different finenesses ranging from median particle sizes of 1.9-17.2 µm. Physical and chemical properties of the Portland cement and the fly ashes were investigated. Mortar cubes of 5 cm were cast with 20% replacement by weight of Portland cement with ground coarse fly ash. The compressive strengths of the fly ash-cement mortars were determined and compared with the control mortar. The results revealed that the degree of pozzolanic reaction, as determined using compressive strength, of coarse fly ash increased when its fineness was increased by grinding. The strength activity indices of the original fly ash-cement mortars at the curing ages of 7 and 28 days were in the range of 69-82% and 76-90%, respectively. When the particle size smaller than 9 µm of ground coarse fly ash was used, the strength activity index achieved was over 100% of that of the control within 28 days. The results also showed that the fineness of fly ash, not the chemical composition, was the major factor affecting the strength activity index of ground coarse fly ash-cement mortar.