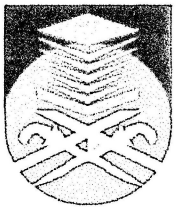

FRACTURE TOUGHNESS OF POLYMER-MIXED CONCRETE

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"We declare that this thesis is the result of our own work except the ideas and summaries which we have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree".

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ABSTRACT

The main objective in conducting this research is to determine the effect of environments such as air and distilled water on the fracture toughness of the polymer-mixed concrete with and without added polypropylene fiber wastes. The effects of added fiber on the strength, toughness and fracture mechanism of polymer-mixed concrete are also studied.

Polymer-mixed concrete with and without fiber slabs were made in the house. Specimens were then machined into two configurations which are 3 point bend configuration and straight coupon type. Tensile test were conducted on the straight coupon type and fracture toughness tests for PCF and PCWF with dry condition were conducted using the 3 point bend type. Both tests were conducted by using the Instron 8500 Servo Hydraulic Digital Machine at displacement rate of 5 mm/min.

Then, samples of PCF and PCWF were soaked into distilled water and their readings of increased weight were collected. The fracture toughness tests for wet PCF and PCWF were also conducted at Strength of Materials laboratory by using the Instron 8500 Servo Hydraulic Digital Machine. The microstructure for both dry and wet samples of PCF and PCWF were conducted at the Metallurgy laboratory.

Finally, data that were collected were analyzed and compiled and the results were discussed and concluded. The existence of water in the polymer-mixed concrete's structure had affected the strength and the toughness of the concrete. Fibers have important roles in increasing the strength and the toughness of polymer-mixed concrete.

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