FINAL YEAR PROJECT REPORT

STUDY ON THE EFFECT OF LOADING RATE ON FRACTURE TOUGHNESS OF WELDED PLATE MATERIAL

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ABSTRACT

Defect assessment against fracture initiated failure is carried out using fracture using fracture characterising parameters determined under quasi-static rates of loading. In practice, however, there are many instances where much higher loading rates prevail such as collision, blast and earthquake damage and in transport. For these situations the rate sensitivity of the material to fracture should be considered.

This project reviews of the fracture toughness for low carbon steel (SA 516 Grade 70) materials after welding used SA 7018 electrode. The performance of weldments is dependent upon the fracture toughness of the various weld regions. Fracture toughness tests (COD - BS 5762 or BS 6729) have been conducted on the welded regions of the test piece over a range of different loading rates. The effect of increased loading rate is to reduce the crack-opening displacement whilst changing the fracture behaviour.

The importance of microstructure in the control of fracture toughness is emphasized.

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