

STUDY OF FATIGUE CRACK PROPAGATION (FCP) OF
POLYMETHYLMETHACRYLATE (PMMA) AT A DIFFERENT
R RATIO .

A project report presented in partial fulfillment of the requirements for the award of Advanced Diploma in Mechanical Engineering of MARA Institute of Technology.

By:

HASHIM BIN ABU HASSAN

DEPARTMENT OF MECHANICAL ENGINEERING
MARA INSTITUTE OF TECHNOLOGY
SHAH ALAM, 40450 SELANGOR.

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SYNOPSIS.

The exact nature of the mechanisms involved in the fatigue failure of polymeric material is by no means well understood. Eventhough a great amount of research effort has been focus on the study of various aspects of the phenomena with component failure under repeated loading conditions, a general criterion for analysis of such failures has not yet established.

The aim of this paper is to examine the empirical evidence on the pattern of crack propagation in Polymethylmethacrylate in the light of linear elastic fracture mechanics concepts and to demonstrate that a particular criterion related to the stress intensity factor, K , with the different values of R_{ratio} .

Compact type specimens are used with dynamic load control Instron Machine Model 8032. Surface crack propagations are observed using traveling microscope in an increamental of 0.1 mm. Fatigue crack propagation resistance shown improved as the R_{ratio} decrease. Another parameter, K_{mean} arises where it should considered and others paper result are included to know the effect.

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