

Accepted Manuscript

A new mixed mode I/II fracture test specimen: Numerical and experimental studies

S. Pirmohammad, M. Hojjati Mengharpey

PII: S0167-8442(18)30193-9
DOI: <https://doi.org/10.1016/j.tafmec.2018.08.012>
Reference: TAFMEC 2091

To appear in: *Theoretical and Applied Fracture Mechanics*

Received Date: 18 April 2018
Revised Date: 19 August 2018
Accepted Date: 22 August 2018

Please cite this article as: S. Pirmohammad, M. Hojjati Mengharpey, A new mixed mode I/II fracture test specimen: Numerical and experimental studies, *Theoretical and Applied Fracture Mechanics* (2018), doi: <https://doi.org/10.1016/j.tafmec.2018.08.012>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



A new mixed mode I/II fracture test specimen: numerical and experimental studies

S. Pirmohammad^{a,*} and M. Hojjati Mengharpey^a

^a*Department of Mechanical Engineering, Faculty of Engineering, University of Mohaghegh Ardabili, Ardabil, 179, Iran.*

Abstract

This paper suggests a new test configuration, namely the disc bend (DB) specimen, for determining mode I, mixed mode I/II and mode II fracture toughness of brittle materials. The proposed specimen is a disc-type one containing an edge crack, which is subjected to three-point bend loading. The stress intensity factors, K_I and K_{II} , were obtained by performing many three-dimensional finite element analyses on the suggested DB specimen with different geometrical parameters and loading conditions. Based on the numerical analyses, different loading conditions from pure mode I to pure mode II can be produced by changing the crack distance from the middle point of the DB specimen. Finally, applicability of the proposed DB specimen was studied from the experimental point of view. For this purpose, several fracture experiments were successfully conducted on the white marble rock and PMMA (polymethylmethacrylate) materials under different loading modes.

Keywords: Stress intensity factor; Mixed mode I/II; Disc bend specimen; Fracture toughness

* Corresponding author. Tel.: +98 45 3351 7030; fax: +98 45 3351 2904.
E-mail address: s_pirmohammad@uma.ac.ir (Sadjad Pirmohammad).

Download English Version:

<https://daneshyari.com/en/article/11004091>

Download Persian Version:

<https://daneshyari.com/article/11004091>

[Daneshyari.com](https://daneshyari.com)