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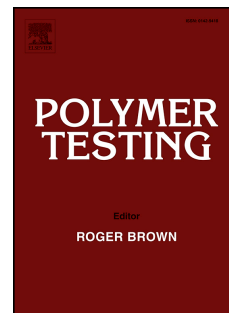
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Tensile fracture analysis of a ductile polymeric material weakened by U-notchesA.R. Torabi ^{a,1}, A.S. Rahimi ^b, M.R. Ayatollahi ^b

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Abstract

Fracture of a ductile epoxy polymer containing U-notches was investigated both experimentally and theoretically under pure opening mode. Two various U-notched polymeric specimens with different notch tip radii were utilized in the experiments; one of them was loaded under remote tension and the other under three-point bending. The load-carrying capacities (LCCs) of the U-notched polymeric specimens were experimentally recorded. To predict the experimentally obtained LCCs, the Equivalent Material Concept (EMC), proposed originally by the first author, was reformulated for the ductile polymer tested. Then EMC was linked to two well-known brittle fracture criteria, namely the maximum tangential stress (MTS) and mean stress (MS) criteria. It is shown that both the EMC-MTS and EMC-MS criteria predict the experimental results well without needing elastic-plastic analyses of the polymer specimens.

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