عنوان مقاله:

Investigation of Clamp Geometry Effects on the FractureCharacterization by Modified Arcan Fixture

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خلاصه مقاله:

This study presents investigation of clamp geometry effects on the fracture characterization of the materials by using modified Arcan fixture. In most applications fracture occurs in mode-I (tensile), mode-II (shear), or the combination of shear and tensile modes. In modified Arcan fixture by varying the loading angle, from 0o to 90o, pure mode-I, pure mode-II and mixed mode data can be obtained. The test fixture and sample were modelled with ABAQUS/CAE and the contour integral method was used at various loading angles to calculate the non-dimensional stress intensity factors. To study the effect of mixed mode loading conditions, the fracture parameters were studied at loading intervals of 3o. By investigating the values of non-dimensional stress intensity factures, a non- uniformity is shown in the values of mode-II non-dimensional stress intensity factures close to pure mode-II loading. By investigating the influence of clamp geometry it was resulted that this non-uniformity was due to the geometry of modified Arcan fixture. This study also investigated the influence of deformation of fixture on the values of fracture parameters. Results showed that by reforming the geometry of modified Arcan fixture the non-uniformity was omitted.

کلمات کلیدی:

Fracture mechanics, Mixed-mode, Modified Arcan fixture, Finite-element analysis