Fracture toughness characterization through notched small punch test specimens - DTU Orbit (05/02/2019)

Fracture toughness characterization through notched small punch test specimens

In this work a novel methodology for fracture toughness characterization by means of the small punch test (SPT) is presented. Notched specimens are employed and fracture resistance is assessed through a critical value of the notch mouth displacement \( \delta_{\text{SPT}} \). Finite element simulations and interrupted experiments are used to track the evolution of \( \delta_{\text{SPT}} \) as a function of the punch displacement. The onset of crack propagation is identified by means of a ductile damage model and the outcome is compared to the crack tip opening displacement estimated from conventional tests at crack initiation. The proposed numerical-experimental scheme is examined with two different grades of CrMoV steel and the differences in material toughness captured. Limitations and uncertainties arising from the different damage phenomena observed in the lowest toughness material examined are thoroughly discussed. (C) 2016 Elsevier B.V. All rights reserved.

General information
State: Published
Organisations: University of Oviedo
Contributors: Martínez Pañeda, E., García, T. E., Rodriguez, C.
Pages: 422-430
Publication date: 2016
Peer-reviewed: Yes

Publication information
Volume: 657
ISSN (Print): 0921-5093
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 3.76 SJR 1.694 SNIP 1.943
Web of Science (2017): Impact factor 3.414
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.39 SJR 1.669 SNIP 1.913
Web of Science (2016): Impact factor 3.094
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 3.01 SJR 1.742 SNIP 1.858
Web of Science (2015): Impact factor 2.647
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 3.32 SJR 2.235 SNIP 2.546
Web of Science (2014): Impact factor 2.567
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.86 SJR 1.868 SNIP 2.235
Web of Science (2013): Impact factor 2.409
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.5 SJR 1.744 SNIP 2.358
Web of Science (2012): Impact factor 2.108
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.59 SJR 1.74 SNIP 2.414
Keywords: CTOD, Damage, Finite elements, Fracture toughness, Small punch test

DOIs:
10.1016/j.msea.2016.01.077

Source-ID: 2291706672

Research output: Research - peer-review > Journal article – Annual report year: 2016