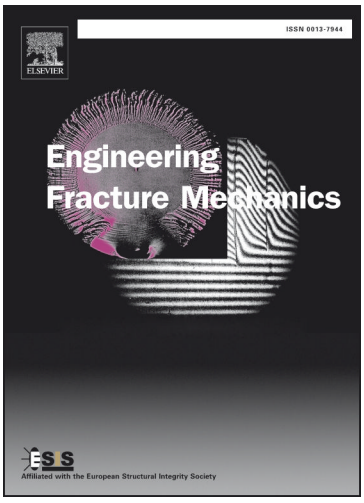

The admissible range of notch root radius for applying the singular stress field to its fracture analysis

D.H. Chen, L. Chen

PII: S0013-7944(18)30676-3
DOI: https://doi.org/10.1016/j.engfracmech.2018.09.005
Reference: EFM 6140

To appear in: *Engineering Fracture Mechanics*

Received Date: 5 July 2018
Accepted Date: 4 September 2018

Please cite this article as: Chen, D.H., Chen, L., The admissible range of notch root radius for applying the singular stress field to its fracture analysis, *Engineering Fracture Mechanics* (2018), doi: https://doi.org/10.1016/j.engfracmech.2018.09.005

The admissible range of notch root radius for applying the singular stress field to its fracture analysis

D.H.Chen[a,b] and L.Chen[c,*]

[a] *National Center for International Research on Structural Health Management of Critical Components, Jiangsu University, 301 Xuefu Road, Jingkou, Zhenjiang 212013, China*

[b] *State Key Laboratory for Strength and Vibration of Mechanical tructures, Xi'an Jiaotong University, Xi'an 710049, China*

[c] *Faculty of Civil Engineering & Mechanics, Jiangsu University, Zhenjiang 212013, China*

[*] *Corresponding Author. E-mail address: chen1573@ujs.edu.cn*

Abstract

In this study, the problem of "what is the critical value of notch root radius ρ_{max} below which the fracture load of the notch with $\rho \neq 0$ can be evaluated by using the singular stress field for a sharp notch" is investigated analytically. Based on the existing fracture criteria, the ultimate loading stresses σ_f and σ_F are respectively calculated by using numerical analysis called body force method for the blunt notch and by using the singular stress field for the corresponding sharp notch. By comparing σ_f with σ_F, the admissible maximum notch root radius ρ_{max} is investigated. Based on the investigation, it is found that when the notch root radius