Two Parameter Engineering Fracture Mechanics: calculation of the relevant parameters and investigation of their influence on the surface notch

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In the present research, T-stress solutions are provided for a U-shaped notch in the case of four specimens: CT, DCB, SENT and Romain Tile. The U-shaped notch is analyzed using the finite element method to determine the stress distribution ahead of the notch tip. In contrast to a crack, it was found that the T-stress is not constant and depends on distance from the notch-tip. To estimate the T-stress in the case of a notch, a novel method, namely, method of line, inspired from the volumetric method approach proposed by Pluvinage has been developed. Thus, the two-parameter approach was adopted for the notch two-parameter fracture mechanics in terms of the notch stress intensity factor $K_{\rho c}$ and the effective (average) T-stress, T_{ef}. Fracture toughness transferability curve ($K_{\rho c}$ -T_{ef}) of X52 pipe steels has been established. 6