



Designation: E 1921 – 02³

Standard Test Method for Determination of Reference Temperature, T_o , for Ferritic Steels in the Transition Range¹

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1. Scope

1.1 This test method covers the determination of a reference temperature, T_o , which characterizes the fracture toughness of ferritic steels that experience onset of cleavage cracking at elastic, or elastic-plastic K_{Jc} instabilities, or both. The specific types of ferritic steels (3.2.1) covered are those with yield strengths ranging from 275 to 825 MPa (40 to 120 ksi) and weld metals, after stress-relief annealing, that have 10 % or less strength mismatch relative to that of the base metal.

1.2 The specimens covered are fatigue precracked single-edge notched bend bars, SE(B), and standard or disk-shaped compact tension specimens, C(T) or DC(T). A range of specimen sizes with proportional dimensions is recommended. The dimension on which the proportionality is based is specimen thickness.

~~1.3 Requirements are set on specimen size and the number of replicate tests that are needed to establish acceptable characterization of~~

~~1.3 Median K_{Jc} data populations.~~

~~1.4 The statistical effects of values tend to vary with the specimen type at a given test temperature, presumably due to constraint differences among the allowable test specimens in 1.2. The degree of K_{Jc} variability among specimen types is~~

¹ This test method is under the jurisdiction of ASTM Committee E08 on Fatigue and Fracture and is the direct responsibility of E08.08 on Elastic-Plastic Fracture Mechanics Technology.

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