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Standard Terminology Relating to Fatigue and Fracture Testing[1]

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1. Scope

1.1 This terminology contains definitions, definitions of terms specific to certain standards, symbols, and abbreviations approved for use in standards on fatigue and fracture testing. The definitions are preceded by two lists. The first is an alphabetical listing of symbols used. (Greek symbols are listed in accordance with their spelling in English.) The second is an alphabetical listing of relevant abbreviations.

1.2 This terminology includes Annex A1 on Units and Annex A2 on Designation Codes for Specimen Configuration, Applied Loading, and Crack or Notch Orientation.

2. Referenced Documents

2.1 *ASTM Standards:*

E 6 Terminology Relating to Methods of Mechanical Testing[2]

E 338 Test Method for Sharp-Notch Tension Testing of High-Strength Sheet Materials[2]

E 399 Test Method for Plane-Strain Fracture Toughness of Metallic Materials[2]

E 436 Test Method for Drop-Weight Tear Tests of Ferritic Steels[2]

E 466 Practice for Conducting Force-Controlled Constant Amplitude Axial Fatigue Tests of Metallic Materials[2]

E 467 Practice for Verification of Constant Amplitude Dynamic Forces in an Axial Load Fatigue Testing System[2]

E 468 Practice for Presentation of Constant Amplitude Fatigue Test Results for Metallic Materials[2]

E 561 Practice for *R*-Curve Determination[2]

E 602 Test Method for Sharp-Notch Tension Testing with Cylindrical Specimens[2]

E 604 Test Method for Dynamic Tear Testing of Metallic Materials[2]

E 606 Practice for Strain-Controlled Fatigue Testing[2]

E 647 Test Method for Measurement of Fatigue Crack Growth Rates[2]

E 739 Practice for Statistical Analysis of Linear or Linearized Stress-Life (S-N) and Strain-Life (ϵ-N) Fatigue Data[2]

E 740 Practice for Fracture Testing with Surface-Crack Tension Specimens[2]

E 812 Test Method for Crack Strength of Slow-Bend Precracked Charpy Specimens of High-Strength Metallic Materials[2]

E 813 Test Method for J_{Ic}, a Measure of Fracture Toughness[3]

E 992 Practice for Determination of Fracture Toughness of Steels Using Equivalent Energy Methodology[4]

E 1049 Practices for Cycle Counting in Fatigue Analysis[2]

E 1152 Test Method for Determining *J-R* Curves[3]

E 1221 Test Method for Determining Plane-Strain Crack-Arrest Fracture Toughness, K_{Ia} , of Ferritic Steels[2]

E 1290 Test Method for Crack-Tip Opening Displacement (CTOD) Fracture Toughness Measurement[2]

E 1304 Test Method for Plane-Strain (Chevron-Notch) Fracture Toughness of Metallic Materials[2]

E 1457 Test Method for Measurement of Creep Crack Growth Rates in Metals[2]

E 1681 Test Method for Determining a Threshold Stress Intensity Factor for Environment-Assisted Cracking of Metallic Materials Under Constant Load[2]

E 1737 Test Method for *J*-Integral Characterization of Fracture Toughness[5]

E 1820 Test Method for Measurement of Fracture Toughness[2]

G 15 Terminology Relating to Corrosion and Corrosion Testing[6]

3. Terminology

3.1 *Alphabetical Listing of Principal Symbols Used in This Terminology:*

Symbol	Term
a	crack depth, crack length, crack size, estimated crack size
a_e	effective crack size
a_n	notch length
a_o	original crack size

[1] This terminology is under the jurisdiction of ASTM Committee E08 on Fatigue and Fracture and is the direct responsibility of Subcommittee E08.02 on Standards and Terminology.

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[2] *Annual Book of ASTM Standards*, Vol 03.01.

[3] Discontinued. Replaced by E 1737. See 1996 *Annual Book of ASTM Standards*, Vol 03.01.

[4] Discontinued. See 1996 *Annual Book of ASTM Standards*, Vol 03.01.

[5] Discontinued. Replaced by E 1820. See 1997 *Annual Book of ASTM Standards*, Vol 03.01.

[6] *Annual Book of ASTM Standards*, Vol 03.02.

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