Subject Index

A	microstructurally small cracks, 203
	vector approach, mixed-mode fracture, 21
Aluminum alloys	Crack tip opening angle, 111
elastic-plastic crack growth, 279	Crack-tip opening displacement, mixed-mode
load-sequence-induced mixed-mode fatigue	fracture criterion, 86
crack growth, 258	Crack tip plastic zones, 74
microtexture, asperities, and crack deflection,	Crack tip sliding displacement, 21
160	Cross-ply laminates, 143
Aluminum composites, mixed-mode crack growth, 174	Crystal plasticity, 203
Anisotropic bimaterials, elliptical interface cracks, 143	D
Asperities, 160	Delamination, 143
Asymmetric four-point bending, 3	Ductile fracture
, ,	elastic-plastic, 3
	thin structures, 21
В	
	E
Central notched specimens, 279	~
Ceramic composites, micromechanical modeling of	Elasticity, 174
crack growth, 174	Elastic-plastic conditions, mixed-mode CTOD
Circumferential fatigue crack, 295	criterion, 86
Cohesive force, 174	Elastic-plastic ductile fracture, metallic materials, 3
Compact tension shear specimens, 279	Elastic-plastic finite element analysis, 58
Crack closure, roughness-induced, 160	Elastic-plastic fracture, 279
Crack growth	Elliptical interface cracks, mixed-mode fracture
CTOD critical value, 86	mechanics parameters, 143
curved, 58	Engineering Treatment Model, 21
elastic-plastic, 111, 279	Epoxide resin, silica particulate filled, mixed-mode
near-threshold, 312	fracture behavior, 129
stable, 21, 58	
thresholds, 229	F
Crack propagation, 174	
circumferential, 295	Fatemi-Socie critical plane fatigue parameter, 203
dynamic, 174	Fatigue, 160
polyrystalline metals, 229	Fatigue crack growth, load-sequence-induced,
rate, combined torsional and axial loadings, 295	fractographic study, 258
Crack reorientation criterion, 279	Fatigue cracks, polycrystalline metals, 229
Cracks	Finite element method, 111
branching, 258	temperature effect on mixed-mode fracture
deflection, 160	behavior, 129
kinking, 58, 86	Flaw assessment, 21
path, 279	Fourier transform, 143
speed, 174	Fractography, 3, 295
three-dimensional, 143	load-sequence-induced mixed-mode fatigue
Crack tip displacement	crack growth, 258

Fracture boundary curve, 129 Microtexture, 160 Fracture mechanics, 111, 295 Mixed-mode crack growth, micromechanical Fracture mode, 174 modeling, 174 Fracture stress in shear, 41 Mixed-mode crack surfaces, aluminum, 160 Fracture stress in tension, 41 Mixed-mode energy release rate, 143 Fracture toughness Mixed-mode fatigue behavior, polycrystalline determination, 74 metals, 229 transition between opening and in-plane shear Mixed-mode fatigue crack growth modes, 3 central notched and compact tension shear FRANC2D/L software, extension, 111 specimens, 279 load-sequence-induced, fractographic study, 258 Mixed-mode fracture G crack tip displacement vector approach, 21 Gurson-Tvergaard model, 3 criterion, crack-tip opening displacement, 86 mechanics, parameters, elliptical interface cracks, 143 н toughness, silica particulate filled epoxide resin, High cycle fatigue, 203 transition between tensile and shear mechanisms, High temperature, 312 Hoop stress criterion, maximum, 129 Mixed mode I/II elastic-plastic fracture, twodimensional, 111 I Mixed-mode I/III fatigue crack, 295 Mixed-mode static crack growth, central notched Inhomogeneous materials, 174 and compact tension shear specimens, 279 Interface fracture, anisotropic bimaterials, 143 Mode I fracture transition between tensile and shear mechanisms, 41 J toughness J-integral, 3, 295 determination, 74 silica particulate filled epoxide resin, 129 Mode II fracture L crack tip displacement vector approach, 21 toughness, determination, 74 Lap splice joint, 58 transition between tensile and shear mechanisms, Laue patterns, 160 Loading combined torsional and axial, 295 Mode III fracture, transition between tensile and mixed-mode, near-threshold crack growth, 312 shear mechanisms, 41 mixed mode I-II loading, effects on elastic-Moiré interferometry, 58 plastic ductile fracture, 3 Multiaxial loading, polycrystalline metals, 229 programmed, 258 Local failure criterion, 129 N M Nickel-base superalloy, near-threshold crack growth, 312 Metallic materials, elastic-plastic ductile fracture, 3 Numerical simulation, 174 Micromechanical modeling, mixed-mode crack

Metallic materials, elastic-plastic ductile fractu Micromechanical modeling, mixed-mode cracl growth, 174 Microslip, polycrystal orientation effects, 203 Microstructure nickel superalloy, 312 polycrystalline metals, 229 small cracks, microslip and mixed mode behavior, 203

P

Polycrystalline metals, mixed-mode fatigue behavior, 229 Polycrystal orientation, effects on microslip and mixed mode behavior, 203 R

Residual strength, prediction, 111 Retardation effects, 258 Richard's criterion, 129 Roughness-induced closure, 160

S

Semiconductor package, 129 Shear fracture, 3 toughness, mode II, 74 transition to tensile mechanisms, 41 Silica particulate filled epoxide resin, mixed-mode fracture behavior, 129 Single edge notched specimens biaxially loaded, fatigue precracked, 58 elastic-plastic ductile fracture, 3 Sliding contact, 295 Small cracks, microstructure, 203 Software framework, two-dimensional mixed mode I/II elastic-plastic fracture, 111 Specimen size, requirements, 74 State variable mapping, 111 Steels

circumferential fatigue crack, 295 elastic-plastic crack growth, 279 Stress intensity factor, 3 combined torsional and axial loadings, 295 elliptical interface cracks, 143 Striation, 295 Stroh method, 143 Synchrotron radiation, 160

T

Tearing, 111 Tear straps, 58 Tensile fracture, transition to shear mechanisms, 41 Tensile stress, maximum, 111 $T_{\mathbf{E}}^*$ integral, curved crack growth, 58

V

Validity criteria, 74

X

X-ray diffraction, microbeam, 160