

Index

A

- Acoustic emission, 541, 560
- Airy's stress function, 201
- Antibuckling guides, 131
- Area estimation procedure, 271, 276, 286

B

- Bauschinger effect, 200
- Bend specimens
 - Deeply cracked, 38, 45
 - Three point, 17, 49, 236, 269, 346, 353
- Biaxiality, 215
- Blunting line, 393, 489, 544
- Body centered cubic, 539
- Boundary layer analysis, 186, 216, 219
- British Standards Institute, 317, 608, 635
- Brittle fracture, 363

C

- Center cracked panel, 71, 101, 108, 269, 290
- Center cracked strip, 9, 10, 59, 71
- Charpy correlation, 490
- Charpy energy, 508
- Cleavage
 - Fracture, 365
- Instability, 5, 15, 23, 260, 322
- Rupture, 525

Closure

- Load, 727, 738
- Stress, 12

Compact specimens

- 290, 347, 355

Compliance calibration

Complimentary work

Computer interactive testing

Crack driving force

Crack growth

- Initiation, 49
- Simulation, 71
- Stable, 49, 126, 131
- Unstable, 53, 226

Crack opening angle (COA)

- 98, 115, 116, 124, 203

Crack opening displacement (COD)

- 88, 118, 195, 316, 328, 386, 608

COD design curve

Crack tip

- Acuity, 370, 465
- Force, 124
- Opening ration, 180

Crack velocity

Creep studies

Criteria

- Failure, 67, 604
- Instability, 13, 27
- Recoverable energy, 128
- Tresca, 20, 691
- Von Mises, 20, 154, 668

Critical

- Crack length, 659
- Crack opening displacement, 634
- Energy release rate, 148
- Thickness, 408

Cyclic J , 725
 Cyclic plastic zone, 721

Equivalent energy, 379, 386, 403
 Equivalent length, 254, 705

D

Damage function, 231
 Deep surface flaw, 13
 Deformation theory of plasticity, 43, 61, 80, 94, 112, 115
 Double cantilever beams, 14
 Double edged cracked strip, 11, 23, 56
 Ductile-brittle transition, 332, 373
 Ductile fracture, 65, 230
 Ductile tearing, 365
 Dynamic
 Compact tests, 499
 Fracture toughness, 515, 532, 681
 J-Integral tests, 506
 Resistance curves, 41, 525
 Tear energy, 473
 Yield strength, 530

E

Eddy current, 454
 Effective
 Crack size, 289
 Elastic modulus, 291
 Elastic span, 251
 Elastic compliance, 427, 444, 562, 741
 Elastic-plastic deformation, 6, 40
 Elastic shortening, 19
 Electrical potential, 336, 415, 559, 648, 661
 Elliptical surface flaw, 73, 230
 Energy
 Deformation, 380
 Rate definition, 286, 276
 Separation rate, 70, 71
 Epoxy model, 694
 Equi-biaxial state, 44

F

Face centered cubic, 539
 Failure assessment diagram, 582, 597
 Failure curve, 586
 Fatigue, 704
 Fatigue crack growth, 722, 731, 742
 Fatigue failure, 716
 Finite element
 Constraint strain elements, 76, 125, 155, 165
 Elastic-plastic, 74, 123, 131, 199, 227
 Equations, 153
 Hybrid displacement model, 199
 Isoparametric elements, 76, 165, 216
 Mesh, 80, 97, 157, 165, 246
 Model, 74, 80, 202
 Three dimensional, 664
 Finite strain studies, 92
 First load drop, 478, 486
 Flow theory, 62, 94
 Incremental, 43, 80
 J_2 , 68, 70, 80, 113
 Fracture parameter, 72, 104, 110

G

G , strain energy release rate, 28, 204, 272, 338
 Gaussian integration, 201
 Geometry dependance, 359, 654
 Girth welds, 626, 633
 Grain boundaries, 309

H

Heat tinting, 78, 431, 559
 Hydrostatic stress, 166

I

- Irradiation damage, 23, 263, 661
 Incremental polynomial, 725
 Instability, 5, 13, 27, 66, 637
 Instrumented Charpy, 495

J

- J*-controlled crack growth, 38, 42, 43, 113, 186
J-dominance, 177, 186
J-resistance curve, 5, 39, 66, 464, 644

K

- K*-field, 103
 K_{lc} test, 105
 Kirchhoff stress, 178

L

- Large-scale yielding, 37
 Least squares fit, 504, 750
 Limit load, 18, 344
 Limit moment, 14, 18, 48
 Linear elastic fracture mechanics, 13
 Liquified natural gas tanks, 628
 Log deviate, 505
 Linear variable displacement transducer (LVDT), 131

M

- Margin of safety, 66
 Martensite transformation, 537, 549
 Metallurgical mechanisms, 359
 Microstructure, 372
 Minimum ligament, 411
 Minimum specimen thickness, 421
 Mixed mode fracture, 73
 Multiple specimen test, 566

N

- National Bureau of Standards, 628, 633
 Neuber's equation, 689, 697, 705
 Nodal force, 171, 197, 218, 248
 Nodal release, 155, 168
 Nonmetallic inclusions, 309
 Nonpropagating cracks, 709
 Notch ductility factor, 697
 Notch plasticity, 706
 Notch round bars, 18, 58
 Nozzle corner, 676, 686
 Nuclear pressure vessels, 123, 495, 516, 676
 Nuclear reactor, 643, 677

O

- Offshore oil platform, 623

P

- Part through cracks, 610, 695
 Path independence, 93
 Phase transformation, 546
 Photo-elastic analysis, 626
 Plane strain, 7, 9, 55, 128
 Plane stress, 51, 59, 67
 Plastic collapse load, 582, 595
 Plastic constraint, 746
 Plastic zone
 Cyclic, 721
 Monotonic, 721
 Shape, 168
 Size, 104, 215
 Plasticity theory
 Deformation, 43, 61, 80, 94, 112
 Incremental flow, 43, 80
 J_2 flow, 68, 70, 80, 113
 Prandtl-Reuss, 133, 154, 191, 709
 Post yield fracture, 582
 Prandtl slip line, 167

- Prandtl stress, 166
 Precracked Charpy specimen, 680
 Pressure vessels, 123, 495, 516, 628,
 676
 Process zone, 70, 103, 118, 127, 138,
 210, 435
 Proportional loading, 41
- Q**
- Quasi-brittle fracture, 314
- R**
- R*-values, 127
 Ramberg-Osgood stress strain, 50, 59
 Rate sensitive materials, 23
 Reactor coolant piping, 553
 Reference toughness curve, 553
 Residual stress, 592, 619, 629, 640,
 653
 Resistance curves, 5, 39, 66, 464, 644
 Rubber infiltration, 74, 102, 438
- S**
- Secant method, 409, 544
 Secant offset, 273
 Semi-elliptical surface crack, 236
 Separation energy rates, 172, 216,
 225
 Shear lip, 3, 63, 427, 434
 Short crack lengths, 712
 Side grooves, 77, 101, 427, 434
 Silicone rubber replicas, 438
 Single parameter characterization,
 67, 358
 Single specimen tests, 451
 Singularity, 41
 Size independence of *R*-curves, 7
 Slip line fields, 10, 22, 106
 Slip line solutions, 176
 Small-scale yielding, 37
 Specimen size effect, 398, 414
- Specimen size requirements, 491
 Stable crack growth, 49, 126, 131
 Steels
 A508, 561
 A516, 471
 A533, 67, 471, 516
 Austenitic stainless, 548, 554
 CrMoV, 740
 Ferritic, 521
 HY103, 471
 NiCrMo, 387
 Rotor forging, 361
 Stiffness matrix, 155
 Strain energy density, 127
 Strain energy release rate, 28, 204,
 272, 338
 Strain field, 137, 151
 Strain hardening, 38, 49, 51, 60, 68,
 105, 172, 724
 Strain hardening laws,
 Isotropic, 165, 178
 Multilinear, 665
 Power hardening, 176
 Ramberg-Osgood, 207, 294
- Stress
 Maximum hoop, 634
 Prandtl field, 107, 166
 Residual, 592, 619, 629, 640, 653
 Secondary, 593
 Thermal, 592
- Stress intensity
 Factors, 198, 717
 Magnification factors, 611
 Stretch zone, 309, 365, 391
 Strip yield model, 31, 309, 609
 Submerged arc weld, 512
- T**
- Tangent modulus, 689, 697
 Tearing instability, 6, 14, 25, 251
 Tearing
 Instability, 6, 14, 25, 251
 Modulus, 8, 24, 118, 255, 574

- | |
|---|
| <p>R</p> <p>Resistance, 20
Stable, 6, 365
Temperature dependence of toughness, 373
Tension component in bend specimens, 2, 71
Tension testing, 473
Testing machine stiffness, 28
Through cracks, 236
Triaxial
 Stress, 247, 369
 Tension, 176, 372, 375</p> <p>U</p> <p>Uncracked body energy, 510
Unloading compliance, 78, 429, 559, 562</p> <p>V</p> <p>Variable secant method, 417
Void
 Coalescence, 74, 176, 234</p> <p>W</p> <p>Work density, 71</p> <p>X</p> <p>X-rays, 627</p> <p>Y</p> <p>Yielding
 Large scale, 37
 Small scale 37
 Surface, 191</p> <p>Z</p> <p>Zirconium, 644</p> |
|---|