Subject Index

A

ABAQUS, 373
Alumina, 228
        coarse-grained, 161
Arrhenius law, 360

B

Batdorf's theory, 390
Bending, 84, 98
        configuration, 250
Bootstrap ratio techniques, 291
Bridging interactions, 161
Brittle materials, 143

C

CARES, 390
Cavities, 127
Ceramic Technology Program,
        3
Competing risk, 3
Component reliability, 291
Composites
        ceramic matrix, 175
        continuous fiber reinforced, 207
Compression, 84
Confidence intervals, 291
Constitutive equations, 62
Continuum damage mechanics,
        207, 373
Crack growth, 98, 127
        slow, 309
        subcritical, 161, 228, 390
Cracking, 84
Creep, 19, 127, 373
        damage, 207
        deflection, 84
        life prediction, 207
        modeling, 360
        rupture, 36, 62, 207, 309
C-ring tests, 333

D

Damage, continuum, 373
Defect density, 192
Defect distributions, 280
Deformation
        creep-induced, 19
        high temperature, 360

E

Elemental strength concept, 175

F

Failure, delayed, 161
Failure, multiaxial, 265, 280
Failure predictions, 175
        probability, 112, 333, 346
        weakest link, 192
Failure properties, 112
Failure theories, 143, 280
Fatigue, cyclic, 161
Fatigue, dynamic, 228
Fatigue life prediction, 98
Fatigue parameter estimation, 390
Fatigue, static, 161
Finite element analysis, 143,
        309, 333, 360
Flaw distribution, 112
Flaw strength, 175
Flexure tests, 84, 228
Fracture, 19, 127, 280
        analysis methodology, 265
        local risk, 346
        mechanism maps, 36
        mixed mode, 192
        strength, 250
        stresses, 228

G

Gaussian quadrature, 143
**412 CERAMIC MATERIALS**

### H
- Heat exchanger tubes, 373
- Pooled strength data, 265, 291
- Porosity, 192
- Probabilistic design, 280
- Methods, 291
- Proof testing, 346, 390

### L
- Likelihood ratio techniques, 291
- Linear regression, 250
- Loading, 98
  - Constant, 161
  - Cyclic, 19, 161
  - Factors, 265
  - Multiaxial, 346
  - Proof test, 390
  - Thermomechanical, 62
- Multiaxial fracture modes, 265
- Multiaxial loading, 346
- Multiaxial strength, 192
- Multiaxial stress, 280

### M
- Machining, 3
- Maps, fracture mechanisms, 36
- Maximum likelihood technique, 250
- Mechanical testing, 3
- Modeling
  - Computer, stress distribution, 333
  - Creep, 360
  - Micromechanical, 207
  - Multiaxial, 175
  - Weakest link, 192
  - Weibull, 112
- Modulus of rupture, 127
- Multiaxial fracture modes, 265
- Multiaxial loading, 346
- Multiaxial strength, 192
- Multiaxial stress, 280

### N
- Neutral axis, 84

### O
- O-ring tests, 333

### P
- Plane stress approximation, 333
- Scale factors, 175
- Scanning electron microscopy, 175
- Silicon carbide, 309, 373
- Silicon nitride, 3, 36, 62, 112
  - Creep, 360
  - Hot isostatic pressed, 127
  - Hot-pressed, 84, 98
  - Sintered, 19
  - Structural, 291
- Statistical analysis, 112
- Stiffness, 84
- Strain gaging, 3
- Stress data analysis, 280
- Strength degradation, 228
- Strength, multiaxial, 192
- Strength parameters, 291
- Stress allowables, 36
- Stress, applied, 19
- Stress averaging, Weibull, 390
- Stress dependence, 207
- Stress distribution, 333
- Stress, multiaxial, 265
  - Failure theories, 280
- Stress volume, 265
- Structural reliability, 36
- Surface wave acoustic microscopy, 127
T

Tensile creep, 19, 127
Tensile fatigue, 19, 98
Tensile strength, 3, 127
Tension, 84
Thermomechanical loading, 62
Time-temperature stress
dependence, 127
Tubers, heat exchanger, 373
Tubular components, 309, 333

Weibull analysis, 3, 112, 280
Weibull distribution, 175
Weibull estimators, 250
Weibull modulus, 228
Weibull statistics, 309, 373
Weibull strength parameters, 291
Weibull stress averaging method, 390
Weibull probability, 143, 346
Weibull uniaxial model, 265

W

Weakest link models, 192
fracture statistics, 265

Y

Yttria, 3, 360