CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

Index

activation criterion 194
admissibility, thermodynamic 38
after-effects 42
Airy function 315
alloy, 14
angular derivative 172
angular momentum, law of 34
anisotropy 1
  damage-induced 214, 216
annealing (and rest) 6
antiplane mode 160
antiplane shear 140
averaging operator 175
axiom(s)
  of accompanying local state 281
  of local state 272
  of orthogonality 51
  of thermostatics 264
  of VPIF 34

Barenblatt cohesive stress 156
Barenblatt crack 161
Barenblatt theory 155
Bauschinger effect 4
behaviour
  anelastic 282
  asymptotic 81
  elastic 1; anisotropic 55
Beltrami criterion 19
biharmonic function 315
Bingham model 46
Bingham viscoplasticity 49
body, anisotropic 14
boundary conditions, natural 35
boundary variation 77
boundary-value problem 143
  nonlinear 127
Budin model 46
Burgers model 43

Caquot intrinsic-curve criterion 19
Carathéodory's theorem 267
Carnot's theorem 267
Cauchy representation theorem 13
Cauchy stress tensor 1, 32
Cayley–Hamilton theorem 26
ceramics, brittle 157
characteristic time 44
characterization of the limit load 122
chronology, Newtonian 32
Clausius inequality 271
Clausius term 275
Clausius–Duhem inequality 37, 276, 281
cohesion, absence of 137
cohesive stress, Barenblatt's 156
collapse 121
collapse mechanism 131, 134
compatibility conditions of 32
component, anisotropic linear-elastic 179
composite
  elastoplastic 174
  limit analysis for 197
  with unidirectional fibres 191, 304
computation, numerical 321
concentrations, tensor of 180
condition
  of compatibility 32
  of periodicity 177
  of positivity 55
cone of outward normals 44, 54, 286
configuration, intermediate 167
conservation of mass 163
constitutive equations
  functional 277
  incremental 107
constraint, thermodynamic 38
contact, dissipative, law of 200
continuum damage mechanics 214
convex
  closed 288
  indicator of 147
  macroscopic 186
  of plasticity 45
  set, indicator function 283
  support function 290
  time-dependent 79
convex closed surface 53
convex domain 44
convexity 89, 283
Coulomb criterion, 20

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

coupling, thermal, elastoplasticity with 257
crack front 137
crack propagation 136
  criterion 147
crack system, quasi-static evolution of 150
cracking modes 137
creep 9
creep damage 217
crystals, twinning 278

d'Alembert principle 34
damage 10, 136, 206
  anisotropy induced by 214
  creep 217
  ductile 212, 213, 217
  evolution of 217
  uniaxial 216
damage criterion 208, 210
damage mechanics, continuum 214
decomposition of elastoplastic strains 162
deformation theory, small-strain 119
derivative, angular 172
deviator 3
dilatation coefficients, thermal 246
Dirac's distribution 179
director frame 169
discontinuities, minimum principles in the presence of 91
discontinuity 85, 128, 137
  in velocity 91
displacement field, kinematically admissible (KA) 71
displacement fluctuation 179
dissipation 273
  intrinsic 39, 46, 162, 166, 245, 259
  plastic 184
  thermal 39
dissipation analysis 144
dissipation inequality 38
dissipation potential 45, 275
dissipation pseudo-potential 52
dissipation term, Jouget's 275
distribution of temperature
  in fracture 252
  singularity of 256
Drucker inequality 108, 186
Drucker stability 185
Drucker's postulate 117
dry friction element 8
Dugdale model 156
Duhamel's thermoelasticity 43

effective length 156
eigenvalue system 127
elasticity
  instantaneous 106
  linear 136
  minimum principles 85
  nonlinear 2, 72; minimum principles 89
elasticity coefficients, Lamé's 2
elasticity domain 97, 104
elasticity modulus, effective 209
elastoplastic composites 174
elastoplastic evolution 113
elastoplastic loading of a wedge 293
elastoplastic strains, decomposition of 162
elastoplasticity
  analytic solutions 293
  finite-strain 172
  laws, incremental nature of 57
  of a damaged body 208
  perfect 69
  polycrystal 196
  small-strain 50
  with thermal coupling 257
  working hypotheses 24
energy
  complementary 74, 86; minimum total 74
  critical, dissipated 147
  free, Helmholtz 269, 273
  internal 36
  microscopic, elastic 189
  potential 86
  stored 95, 96
  surface 147
  total potential 72
energy aspect 61
energy–momentum tensor 158
energy norm 189
energy-release rate 148, 149, 150, 158, 260
energy theorem 36
enthalpy 269
entropy 37
envelope, spherical 123
epigraph 283, 284
equation
  evolution 53, 169
  heat 258
  heat propagation 40, 245
  heat conduction 259
  thermal 40
equations
  Euler–Cauchy 34
  mechanical-balance, Newtonian 34
  Prandtl–Reuss 172, 295
  state 50, 188
equilibrium
  limit 122
  thermodynamic 263
  thermostatics at 272
equivalent stress, Mises 310
ergodic hypothesis 178
Euler–Cauchy equations 34

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

evolution
  damage 217
  elastoplastic 113
  in stresses 77
  of plastic strains 80
  quasi-static 77; of crack system 150
  thermodynamic, isothermal 47
  variational, equation of 79
evolution equation 53, 169
evolution law(s) 277
  for internal variables 280
existence proof 180
expansion, anisotropic 187
extensive state variable 263, 268
extremal flow surface 197

fatigue 136, 210
fatigue-creep test 210
Fellenius circles 131
fibre-reinforced structures, 29
fibres, unidirectional, composite with 191
field discontinuity 136
field of virtual velocity 33
field stress, self-equilibrated 178
finite strain 166
finite strain elastoplasticity 172
finite transformation 162
first Piola–Kirchhoff tensor 164
first principle 265
flow criterion, 16
flow law 48
flow rule, associated 62, 117, 118
flow surface, extremal 197
fluctuation displacement 179
flux vector, heat 271
force potential, macroscopic 200
form, Pfaff 167
formula, Green's 323
formulation,
  abstract 114
  axiomatic, of thermostatics 264
  electromechanical 50
  incremenal 69
  mixed 75
  two-field 75
foundation's limit load 130
Fourier condition law 40, 257
fracture 136
  brittle 136, 144
  viscous 147
fracture initiation, criterion of 206
fracture mechanics 136
fracture temperature, distribution in 252
fracture toughness 144
frame
  director 169
  Galilean 32
framed structure 131

free energy, Helmholtz 37, 269, 273
front of crack 137
function(s)
  Airy 315
  biharmonic 315
  conjugate 288
  convex 283
  Green 202
  homogeneous 48
  indicator 53; of a convex set 283
  isotropic 13; scalar-valued 26
  Massieu 270
  Minimization 291
  positively homogeneous 44
  space of 77
  state 264
  stress 300
  support, of the convex 290
  Westergaard's 316
  yield 26
function technique, Green 187
functional constitutive equations 277
functional
  Greenberg 113
  Hodge–Prager 113

Galilean frame 32
general principles 32
generalized Rice integral 149
generalized standard material 94, 150, 189, 191, 202, 212
generalized standard model 107
generalized Tresca criterion 308
Gibbs potential 269
Gibson–Lo model 46
global potential 149
global stability condition 112
gradient, temperature 132
Green formula 323
Green function 202
Green function technique 187
Green-Naghdi decomposition 166
Greenberg functional 113
Greenberg minimum principle 72
Greenberg variational principle 113
Griffith's criterion 147, 150
Gurson's criterion, 21

Haigh–Westergaard stress space, 14
hardening 2, 4, 22, 117
  isotropic 24, 98, 187
  kinematic 24, 97, 187, 193
  measures of 23
  strain- 94; anisotropic 27; kinematic 27
  translation 24
  work 4
hardening equation 21

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

hardening modulus 102, 110, 118, 213
hardening parameter 21
hardening problems 309
heat conduction equation 259
heat equation 258
heat flux vector 271, 36
heat propagation equation 40, 245
heat source concentration 254
Hellinger–Reissner principle 75
Helmholtz free energy 37, 269, 273
Hencky–Ilyushin model 116, 119
Hencky–Nadai relations 63
Hill law 79
Hill–Mandel maximal-dissipation principle 44, 55
Hill–Mandel principle of macrohomogeneity 177
hinge, plastic 134
Hodge–Prager functional 113
Hodge–Prager principle 73
hollow sphere 132
homogeneous, positively 52
  function 44
homogeneous functions 48
homogenization 174, 176, 217
  cracked materials 199
  stabilization by 202
  stable under 197
Hooke's law 3, 140
Huber–Mises criterion 18, 65
Huber–Mises material 990
Huber–Mises plates 28, 48, 89
hull, upper 285
hypoelasticity 67
hysteresis 9, 118
hysteresis cycle 10

ill-posed problem 176
Ilyushin's iterative method 223
Ilyushin's stability 111
impermeable membrane 262
incremental constitutive equations 107
incremental formulation 69
incremental nature of the elastoplasticity laws 57
indicator function 53, 147
  of a convex set 283
indicator of the convex 147
inequality
  Clausius 271
  Clausius–Duhem 281, 276
  Drucker 108, 186
  Young 289
influence, tensor of 180
infrared thermography 245, 250
inhomogeneity 157, 158
initial-load method 244
initiation of fracture, criterion of 206
instantaneous-elasticity rheological model 106
integral,
  dual path-independent 159
  generalized Rice 149
  invariant 158
  Rice–Eshelby–Cherepanov 148, 323
integrodifferential operator 188
intensity factor, stress 143
intensive state variable 263, 268
intermediate configuration 167
internal variable 96, 272, 276
  evolution law 280
  thermodynamics with 276
intrinsic dissipation 162, 166, 245, 259
intrinsic irreversibilities 271
intrinsic power, dissipated 96
irreversible processes, theory of (TIP) 275
isothermal transformations 270
isotropic hardening 98, 187
iterative method, Ilyushin's 223

Jaumann time derivative 169, 171
Jeffreys model 43
Jouget dissipation term 275

Kelvin–Voigt
  thermoviscoelasticity 41
  viscoelastic constituents 204
  viscoelasticity 259
kinematic hardening 24, 97, 187, 193
kinematic-hardening modulus 97
kinematic method 93, 130, 198
kinematic strain-hardening 27
kinematically admissible (KA) displacement field 71
Kirchhoff stress tensor 173

Lagrange tensor 163
Lamé's elasticity coefficients 2, 55
law(s)
  angular momentum 34
  complementary 275
  conduction, Fourier 40, 257
  dissipative contact 200
  elastoplasticity, incremental nature of 57
  evolution 277; for internal variables 280
  first (thermodynamics) 36
  flow 48
  Hill 79
  Hooke's 3, 140
  Lévy–Mises 48
  linear momentum 34
  normality 79, 94, 104, 106, 115
  Schmid 194
  second 37

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

state 50, 274
thermodynamic 36, 252
Lee decomposition 167
Legendre transformation, partial 269
Legendre–Fenchel transformation 53, 61, 103, 211, 279, 288
Lethersich model 42
Lévy–Mises laws 48
Lévy–Mises model 66
Lévy–Mises relations 63
limit elastic 13
singular sequential 65
limit analysis 121
for composites 197, 204
limit equilibrium 122
limit load 121
characterization of 122
foundation's 130
limit-surface, yield 14
linear elasticity 136
linear momentum, law of 34
loading
complex 12
elastoplastic, of a wedge 293
simple 12
time-periodic 10
loading surface, macroscopic 186
local accompanying state 278
local stability condition 112
local state axiom 272
localization 174, 176
localization strain, tensor of 180
localized strain 80
locking materials 66, 118
lower semicontinuity 288

macro-scale 175
macrohomogeneity principle, Hill–Mandel 177
macroscopic convex 186
macroscopic force potential 200
macroscopic loading surface 186
macroscopic potentials 183
main stresses 14
Massieu functions 270
material
brittle 4, 7
composite 174
cracked, homogenization of 199
ductile 7, 206
generalized standard 94, 150, 212
Huber–Mises 90
locking 66, 118
rigid–plastic 47
strain-hardening 132
Tresca 49, 91
maximal-dissipation principle, Hill–Mandel 44, 55
maximum admissible load 122
maximum-distortion-energy theory of yielding 18
maximum-shear theory of yielding 17
Maxwell relation 279
Maxwell viscoelastic constituents 204
Maxwell viscoelasticity 41, 259
mechanical-balance equations, Newtonian 34
mechanism
collapse 131, 134
normal dissipative 50
Melan–Koiter theorem 82
membrane
adiabatic 262
impermeable 262
rigid 262
metal viscoplasticity 64, 280
metallic polycrystals 202
microplasticity 211
microscopic elastic energy 189
microscopic scale 175
microstrains, plastic 211
minimization of functions 291
minimum principle(s)
in elasticity 85
Greenberg 72
Hodge–Prager 73
in nonlinear elasticity 89
in the presence of discontinuities 91
stresses 129
velocities 128
minimum total complementary energy 74
Mises criterion 18, 124, 279, 297, 300
Mises equivalent stress 310
mixed formulations 75
model(s)
Bingham 46
Budin 46
Burgers 43
comblex rheological 49
Dugdale 156
generalized standard 107
Gibson–Lo 46
Hencky–Ilyushin 116, 119
Jeffreys 43
Lethersich 42
Lévy–Mises 66
Perzyna 64
Poynting–Thomson 42
Prager–Mroz 103
Prandtl 46
rheological 41, 49, 95, 103, 106, 249
rigid–plastic 123
Schwendoff 46
standard 42
Tan 46
Taylor 46

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

model(s) (*cont.*)
Terzaghi 46
modulus
effective elasticity 209
hardening 102, 110, 118, 213
kinematic-hardening 97
plasticity 3
secant 119
tangent 98
Mohr criterion 19
monocrystal 162
monothermal ineversibilities 271
monotone operator 287
motion 30
rigid-body 33
multiplicative decomposition 166, 172

natural boundary conditions 35
natural reference state 248
natural specific heat 246
natural state, 246
Newtonian chronology 32
Newtonian mechanical-balance equations 34
Noether's theorem 158
nominal stress 165
nonlinear boundary-value problem 127
nonlinear elastic solid 103
nonlinear elasticity 2, 72
minimum principles 89
nonlinear waves in elastoplasticity 120
nonlinearity 156
normal dissipative mechanism 50
normality law 79, 94, 104, 106, 115
normals, cone of outward 54, 286
notion of singularity 139
numerical computation 321

objectivity 171
Odqvist parameter 24, 100
Onsager–Casimir, reciprocity relations of 275
operator
averaging 175
integrodifferential 188
monotone 287
orthogonal transformation 168
orthogonality axiom 51
orthogonality property 58

parameter hardening 21
partial Legendre transformation 269
path-independent integral, dual 159
perfect elastoplasticity 69
perfect plasticity 54
perfectly plastic 2
periodic structure 177
periodicity conditions 177
Perzyna's model 64
Pfaff form 167
photoelasticity 252, 323
Piola–Kirchhoff tensors
first 164
second 164
stress 2
plane elasticity 315
plane problem 313
plane-strain problems 314
plane-stress problems 314
plastic body, isotropic 26
plastic dissipation 184
plastic element, Saint-Venant 8
plastic hardening 11, 13
plastic hinge 134
plastic media, perfectly 2
plastic microstrains 211
plastic multiplier 58, 102
plastic phenomena 43
plastic potential 54
plastic shakedown 10
plastic strain 38
evolution of 80
work of 23
cumulative 24, 100
plastic work, dissipated 84
plastic zone 156
plastically admissible (PA) stress field 71
plasticity 1
associated 212
convex of 45
perfect 54
plasticity modulus 3
Poisson ratio, secant 120
polycrystal 14, 162, 174, 194
metallic 202
polycrystal elastoplasticity 196
porous media 21
positive hardening, regularization by 114
positively homogeneous function 44, 51
positivity condition 55
potential
dissipation 45, 275
energy 86
force, macroscopic 200
Gibbs 269
global 149
macroscopic 183
plastic 54
Rayleigh's 275
strain-rate 60
stress-rate, complementary 67
thermodynamic 268
power
anelastic 166
intrinsic, dissipated 96
total intrinsic 39

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

Poynting–Thomson model 42
Prager–Mroz model 103
Prager–Ziegler type 97
Prandtl model 46
Prandtl sand-hill analogy 301
Prandtl–Reuss equations 62, 172, 295
Prandtl–Reuss theory 66
proof
  existence 180
  uniqueness 180
propagation
  crack 136; criterion of 147
  criterion 256
  heat, equation of 40, 245
pseudo-potential, dissipation 52
PVP–principle of virtual power 32, 83

quasi-static evolution 77
  of a crack system 150
quasi-statics 36

Rankine criterion 19
ratcheting 10
  rate-of-strain tensor 164
rational thermodynamics 276
Rayleigh potential 275
Rayleigh quotient 129
rearrangements, structural 278
reciprocity relations of Onsager and Casimir 275
reciprocity theorem 87
reference state, natural 248
regularity 62
regularization by positive hardening 114
relation(s)
  Hencky–Nadai 63
  Lévy–Mises 63
  Maxwell 279
  Prandtl–Reuss 62
  reciprocity, of Onsager and Casimir 275
  thermoelastic 132
relaxation 9, 42
representation theorem, Cauchy 13
representative volume element 174
residual stress 132
resistance domain 14
resolved shear stress 194, 281
rest and annealing 6
reversible transformation 266
rheological model 41, 49, 95, 103, 106, 249
  complex 49
rheology 8
Rice integral 323
  generalized 149
Rice–Eshelby–Cherepanov integral 148
rigid membrane 262
rigid-body motion 33
rigid–plastic material 47
rigid–plastic model 123
rule of flow, associated 62, 117, 118
rupture, ductile 136

Saint-Venant plastic element 8
sand-hill analogy, Prandtl 301
sandwich shells 68
saturation 118
scalar-valued function, isotropic 26
scaling of temperature 267
Schmid law 194
Schwedoff model 46
secant modulus 119
secant Poisson ratio 120
second law (thermodynamics) 37
second-order tensor, invariants of 25
second principle 267
second tensor, Piola–Kirchhoff 164
self-consistent method 202
self-equilibrated stress fields 78, 178
semicontinuity, lower 288
sequential limit, singular 65
shakedown 81, 92
  elastic 10
  plastic 10
shear stress, resolved 194, 194
shells 28
  cylindrical 28, 68
  sandwich 68
  Tresca 29
shock waves 120, 170
simple loading 12
simple traction 302
simple waves 120
singular sequential limit 65
singularity
  notion of 139
  temperature distribution 256
slice, torsion of 306
slip-surface 91
small perturbation hypothesis 30, 31
small-strain 'deformation' theory 119
small-strain elastoplasticity 50
small transformation 31
solid media 40
space of functions 77
specific heat, natural 246
sphere, hollow 132
spring element, 8
stability
  Drucker 185
  Ilyushin 111
stability condition
  global 112
  local 112
stabilization by homogenizaton 202
stable under homogenization 197

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

standard material, generalized 94, 150, 189, 191, 202, 212
standard model 42
state
  function of 264
  local, axiom 272
  natural 246
  natural reference 248
  thermodynamic 263
state equations 50, 188
state laws 50, 274
state variable 263
  extensive 263
  intensive 263
static method 92, 129, 199
statically admissible (SA) stress field 71
statistical homogeneity 175
stored energy 95, 96
strain
  elastic 38
  elastoplastic, decomposition of 162
  finite 166
  localized 80
  plastic 38; cumulative 24, 200; evolution of 80; work of 23
  thermoelastic 279
strain elastoplasticity, finite- 172
strain-hardening 94
  anisotropic 27
  kinematic 27
  material 132
strain localization, tensor of 180
strain rate, controlled 121
  influence of 7
strain tensor 31
stress
  Barenblatt's cohesive 156
  effective 209
  equivalent, Mises 310
  evolution in 77
  main 14
  nominal 165
  residual 132
  shear, resolved 194, 281
  thermodynamic 165
  uniqueness in 76
  viscous 38
stress field
  plastically admissible (PA)
  self-equilibrated 78, 178
  statically admissible (SA) 71
stress function 300
stress intensity factor 143, 313, 321, 323
stress rate potential, complementary 67
stress space, Haigh–Westergaard 14
stress tensor
  Cauchy 1, 32
  Kirchhoff 173
  Piola–Kirchhoff 2
structural rearrangements 278
structure
  fibre-reinforced 29
  framed 131
  periodic 177
subdifferentials 285
subgradient 54
  convex-function 45
support function of convex 290
surface
  convex closed 53
  threshold 25
  yield 16
surface energy 147
surface flow, extremal 197
surface interaction 13, 27
surface loading, macroscopic 186

Tan model 46
tangent modulus 98
tangent stiffness method 244
Taylor model 46
temperature, scaling of 267
temperature distribution
  in fracture 252
  singularity of 256
temperature gradient 132
tenacity 144
tensor
  of concentration 180
  energy-momentum 158
  first Piola–Kirchhoff 164
  of influence 180
  Lagrange 163
  rate-of-strain 164
  second Piola–Kirchhoff 164
  second-order, invariants of 25
  strain 31
  strain localization 180, 181
  stress; Cauchy 1, 32; Kirchhoff 173
Terzaghi model 46
tetrahedron argument 35
theorem
  Carathéodory 267
  Carnot 267
  Cayley–Hamilton 26
  energy 36
  Melan–Koiter 82
  Noether's 158
  reciprocity 87
  representation, Cauchy 13
  uniqueness 80, 87
  work 87
theory
  Barenblatt's 155
  deformation, small-strain 119
  internal friction yielding 19

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

irreversible processes (TIP) 275
Prandtl–Reuss 66
yield-line 68
yielding: maximum-distortion-energy 18; maximum-shear, 17
thermal coupling, elastoplasticity with 257
thermal dilatation coefficients 246
thermal dissipation 39
thermal equation 40
thermodynamic admissibility 38
thermodynamic constraint 38
thermodynamic equilibrium 263
thermodynamic evolution, isothermal 47
thermodynamic laws 252
thermodynamic potentials 268
thermodynamic process 263
thermodynamic state 263
thermodynamic stress 165
thermodynamic system 262
thermodynamics
continuous media 262
internal-variable 276
laws of 36
rational 276
thermoelastic relations 132
thermoelastic strain 279
thermoelasticity 43
Duhamel 43
thermography, infrared 240, 245
thermomechanical formulation 50
thermomechanics, continuous-media, general principles 32
thermostatics
at equilibrium 272
axiomatic formulation 264
thermoviscoelasticity 41
Kelvin–Voigt 41
threshold, stress 1
threshold surface 25
time, characteristic 44
time-dependent convex 79
time derivative
convected 171
Jaumann 169, 171
time-periodic loading 10
torsion
circular shaft 299
combined 302
cyclic 304
of slice 306
torsion problem 309
elastic 299
total intrinsic power 39
total potential energy, principle of the minimum 72
toughness, fracture 144
traction 32
simple 302
transformation
adiabatic 265
finite 162
isentropic 47
isothermal 270
Legendre–Fenchel 53, 61, 103, 211, 279, 288
orthogonal 168
partial Legendre 269
reversible 266
small 31
translation hardening 24
Tresca criterion 17, 26, 124, 125, 196
generalized 308
Tresca material 9, 49
Tresca shells 29
twinning of crystals 278
two-field formulation 75

uniaxial damage 216
unidirectional fibres, composite with 191, 304
uniqueness 57, 114
in stress 76
uniqueness proof 180
uniqueness theorem 80, 87
upper hull 285

variable
extensive 268
intensive 268
internal 38, 96, 272, 276; thermodynamics 276
state 263; extensive 263; intensive 263
variational equation of evolution 79
variational principle
Greenberg 113
Hodge–Prager 113
vector, heat flux 36, 271
velocity/ies 72
discontinuity in 91
discontinuity of 91
minimum principle for 128
velocity field, virtual 33
virtual power, principle of 32
virtual velocity field 33
virtual work 36
principle of 87
viscoelastic cases 44
viscoelastic constituents
Kelvin–Voigt 204
Maxwell 204
viscoelasticity
Kelvin–Voigt 259
Maxwell 41, 259
viscoplastic regularization 77
viscoplasticity 63

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521397804 - The Thermomechanics of Plasticity and Fracture - Gerard A. Maugin
Index
More information

viscoplasticity (*cont.*)
  Bingham 49
  of metals 64, 280
viscous phenomena 43
viscous stress 38
viscous type of fracture 147
Voigt's notation 56
volume element, representative 174
von Schleicher criterion, 21
VPIF, axiom of 34

waves
  nonlinear, in elastoplasticity 120
  shock 120, 170
  simple 120
weak solutions 75
wedge, elastoplastic loading 293
Westergaard's function 316
Woehler curve 212
work
  dissipated plastic 84
  of plastic strains 23
  virtual 36; principle of 87
work hardening 4
work theorem 87
working hypotheses in elastoplasticity 24

yield function 26
yield limit-surface 14
yield-line method 68
yield-line theory 68
yield surface 16
yielding
  internal-friction theory of 19
  maximum-distortion-energy theory
    of 18
  maximum-shear theory of 17
Young inequality 289

zero principle 267

© Cambridge University Press www.cambridge.org