

Subject Index

A

- Aging, physical, effects at elevated temperatures on viscoelastic creep, 7
- Aircraft materials
 - heat damage, 37
 - honeycomb sandwich panels, 139
- Axial compression, carbon fiber/PEEK composite tubes, 182

B

- Batch-to-batch variability, regression analysis, 358
- Bimaterial interfaces, mixed-mode fatigue delamination criterion, 371
- Bond strength, skin/flange interface, 105
- Braid angle, 201
- Braids, through-the-thickness tensile strength, 218

C

- Carbon epoxy, textile composites, 218
- Carbon polyether etherketone, 182
- Ceramic fibers testing, metal matrix composites under compression, 278
- Co-curing, skin/flange interface, 105
- Composite end-notched flexure specimens, stacking sequence effect on delamination, 393
- Composite materials
 - advanced polymer matrix, nonlinear behavior, 295
 - carbon fiber/PEEK composite tubes, 182
 - design allowables, 358
 - effects of physical aging at elevated temperatures on viscoelasticity, 7
 - environmental stress cracking, 56
 - extension-twist-coupled laminates, 340
 - fiber-matrix interphase, effect on long-term behavior, 69
 - heat damage, 37
 - hydrothermal-aged fiber-reinforced plastics, 88
 - laminated, Mode III delamination fracture testing, 166
 - metal matrix, 264, 278
 - mixed-mode fatigue delamination, 371
 - preform architecture effect, 201

- reinforced panels, debonding failures, 105
- sandwich beams with syntactic foam cores, 125
- stacking sequence effect on delamination toughness and growth behavior, 393
- through-the-thickness tensile strength, 218
- unidirectional, short-beam shear test, 320
- woven and braided fabric-reinforced, 239
- Composite sandwich beams, with syntactic foam cores, 125
- Compression failure, metal matrix composites, 278
- Compressive stresses, unidirectional composites, 320
- Constitutive response, metal matrix composites under compression, 278
- Creep, viscoelastic, effects of physical aging at elevated temperatures, 7
- Crimp, 239
- Crimp angle, preform architecture, 201
- Cross-ply laminates, fiber-matrix interphase effect on long-term behavior, 69
- Curved beam, through-the-thickness tensile strength, 218

D

- Damage, progressive, metal matrix composites, 264
- Damage mechanics
 - fiber-matrix interphase, 69
 - hydrothermal-aged fiber-reinforced plastics, 88
- Data correlation, unidirectional composites, 320
- Debonding
 - hydrothermal-aged fiber-reinforced plastics, 88
 - metal matrix composites under compression, 278
- Deformation, metal matrix composites, 264
- Delamination
 - mixed-mode fatigue, 371
 - Mode III delamination fracture testing, 166
 - stacking sequence effect, 393

textile composites, 218
 Design, extension-twist-coupled laminates, 340

Design allowables, from regression models, 358

E

Edge crack torsion, Mode III delamination fracture testing, 166

Elastic behavior, composite sandwich beams with syntactic foam cores, 125

Elasticity, advanced polymer matrix composites, 295

Elastic modulus, hydrothermal-aged fiber-reinforced plastics, 88

Elastic properties, woven and braided fabric-reinforced composites, 239

Elastic tailoring, extension-twist-coupled laminates, 340

End-notched flexure specimens, stacking sequence, effect on delamination, 393

Environmental stress cracking, polymeric composites, 56

Extension-twist-coupled laminates, 340

F

Fabric-reinforced composites, 239

Failure modes

composite sandwich beams with syntactic foam cores, 125

fiber-matrix interphase, 69

localized, honeycomb sandwich panels, 139

metal matrix composites, 264

skin/flange interface, 105

Fatigue, fiber-matrix interphase, 69

Fiber architecture, carbon fiber/PEEK composite tubes, 182

Fiber cracking, distributed, metal matrix composites, 264

Fiber-reinforced plastics

hydrothermal-aged, damage mechanics, 88

randomly oriented, 88

Finite element analysis

hydrothermal-aged fiber-reinforced plastics, 88

mixed-mode delamination, 371

skin/flange interface, 105

Fire damage, graphite/epoxy composites, 37

Flexure test, environmental stress cracking, 56

Four-point bending test, skin/flange interface, 105

Fracture, stacking sequence effect, 393

Fracture toughness

Mode III delamination, 166

stacking sequence effect, 393

G

Glass/epoxy composites, 320

Graphite/epoxy composites, 320

fiber-matrix interphase, effect on long-term behavior, 69

heat damage, 37

stacking sequence effect on delamination, 393

H

Hardness measurements, graphite/epoxy composites, 37

Heat damage, graphite/epoxy composites, 37

Honeycomb sandwich panels, localized failure modes, 139

Hot water immersion, fiber-reinforced plastics, 88

I

Impact testing, carbon fiber/PEEK composite tubes, 182

Indentation test, localized failure modes, honeycomb sandwich panels, 139

Inelastic deformation, metal matrix composites, under compression, 278

L

Laminated composites

extension-twist-coupled, 340

Mode III delamination fracture testing, 166

triaxially braided, textile composite materials, 201

M

- Metal matrix composites
 - in-phase thermomechanical fatigue, 264
 - under compression, 278
- Micromechanics analysis
 - advanced polymer matrix composites, nonlinear behavior, 295
 - woven and braided fabric-reinforced composites, 239
- Microscopy, heat damage in graphite/epoxy composites, 37
- Mixed-mode analysis, fatigue delamination, 371
- Modulus, preform architecture effect, 201
- Moiré interferometry, textile composites, 218

N

- Nondestructive inspection, heat damage in graphite/epoxy composites, 37

O

- Off-axis testing, advanced polymer matrix composites, 295

P

- Panel construction, honeycomb, 139
- Physical aging, effects at elevated temperatures on viscoelastic creep, 7
- Plain weave, 239
- Plasticity
 - advanced polymer matrix composites, 295
 - metal matrix composites under compression, 278
- Poisson's ratio, preform architecture effect, 201
- Polyether etherketone, 182
- Polymeric composites
 - effects of physical aging at elevated temperatures on viscoelasticity, 7
 - environmental stress cracking, 56
- Polymer-matrix composites
 - heat damage, 37
 - nonlinear behavior, 295

Q

- Quasi-static testing, carbon fiber/PEEK composite tubes, 182

R

- Ratchetting, 264
- RECIPE, 358
- Regression analysis, design allowables, 358
- Residual stresses, environmental stress cracking, 56

S

- Satin weave, 239
- SCS-6 fiber, 278
- Secondary bonding, skin/flange interface, 105
- Shear behavior
 - effects of physical aging at elevated temperatures, 7
 - preform architecture effect, 201
- Shear deformation theory, 166
- Short-beam shear test, unidirectional composites, 320
- Sigma fiber, 278
- Skin/flange interface, debonding failures, 105
- Solubility parameter, environmental stress cracking, 56
- Solvent effects, environmental stress cracking, 56
- Specific energy absorption, carbon fiber/PEEK composite tubes, 182
- Stacking sequence, effect on delamination toughness and growth behavior, 393
- Static testing, carbon fiber/PEEK composite tubes, 182
- Stiffness, woven and braided fabric-reinforced composites, 239
- Strain energy release rate
 - mixed-mode delamination, 371
 - Mode III delamination fracture testing, 166
 - stacking sequence effect, 393
- Strength
 - composite sandwich beams with syntactic foam cores, 125
 - preform architecture effect, 201
- Stress cracking, environmental, polymeric composites, 56
- Surface treatment, fiber-matrix interphase, 69
- Syntactic foam cores, composite sandwich beams, 125

T

- Temperature, advanced polymer matrix composites, nonlinear behavior, 295
- Tension, preform architecture effect, 201
- Testing
 - advanced polymer matrix composites, 295
 - carbon fiber/PEEK composite tubes, 182
 - composite sandwich beams with syntactic foam cores, 125
 - debonding failures, 105
 - design allowables, 358
 - effects of physical aging at elevated temperatures, 7
 - environmental stress cracking, 56
 - extension-twist-coupled laminates, 340
 - heat damage in graphite/epoxy composites, 37
 - hydrothermal-aged fiber-reinforced plastics, 88
 - localized failure modes, honeycomb sandwich panels, 139
 - metal matrix composites, 264
 - mixed-mode fatigue delamination, 371
 - Mode III delamination fracture, 166
 - preform architecture effect, 201
 - regression models, 358
 - stacking sequence effect on delamination, 393
 - through-the-thickness tensile strength, 218
 - unidirectional composites, 320
 - woven and braided fabric-reinforced composites, 239
- TEXCAD, 239
- Textile composites
 - reinforced, preform architecture effect, 201
 - through-the-thickness tensile strength, 218

- woven and braided fabric-reinforced, 239
- Thermal properties, woven and braided fabric-reinforced composites, 239
- Thermomechanical fatigue, in-phase, 264
- Thermoplastic composites, carbon fiber-reinforced, environmental stress cracking, 56
- Three-point bending test
 - environmental stress cracking, 56
 - skin/flange interface, 105
- Through-the-thickness tensile strength, 218
- Tolerance limits, design allowables, 358
- Torsional stiffness, Mode III delamination fracture testing, 166
- Transverse shear failure, unidirectional composites, 320
- Triaxial braid, 239
 - preform architecture effect, 201
- Tubes, carbon fiber/PEEK, 182

U

- Ultrasonic inspection heat damage in graphite/epoxy composites, 37
- Unidirectional composites
 - metal matrix, 278
 - short-beam shear test, 320

V

- Viscoelasticity, effects of physical aging at elevated temperatures, 7

W

- Weaves, through-the-thickness tensile strength, 218

Y

- Yarn
 - architecture, 239
 - content, 201
 - size and spacing, 201