

## Subject Index

### A

Acoustic pressure method, 7  
 Acousto-ultrasonics (See also  
   Ultrasonics), 95, 105  
 Adaptive systems, 165  
 Adhesive strength, 95  
   metal film, 67  
 Air conditioners, rotary  
   compressors, 287  
 Airframe components, 146  
 Alloy PE-16, 218  
 Aluminum, 77, 273  
 Aluminum-lithium alloys, 213  
 Amplitude distribution  
   analysis, 365  
 Arrival time data, synthetic, 86  
 Artificial flaw, 242  
 Austenitic alloys, 218

### B

Bending, three-point, 395  
 Boron, 77  
 Brazilian tests, 381  
 Bronze particles, impact test, 273

### C

Calibration source, 77  
 Carbon fibers, 395, 416  
 Cavitation, 305  
 Ceramics  
   flaw size and acoustic  
     emission, 242  
   microfracture, 47  
 Composites, 95, 105, 424  
   carbon fiber reinforced  
     laminates, 416  
   fiber, 395  
   fiber-reinforced plastics, 123  
   graphite/epoxy, 404  
   microfracture, 47  
   tensile tests, 123  
 Compressors, rotary, 287  
 Corrosion, acoustic emission test  
   for, 185

Cracks, 347  
   advanced, 146  
   detection, 185, 199, 261  
   growth, 146, 261  
   kinematics, 347  
   microcrack, 47  
   model, elliptical, 365  
   presence, 146  
   surface friction, 199  
 Cycling, thermal, 424  
 Cylinders, compressed gas, 185

### D

Damage detection, 424  
 Data acquisition system, 146  
 Decohesion, 252  
 Deconvolution, 47, 67, 273  
 Debonding, 252  
 Deformation  
   compressive, 252  
   inelastic, 365  
   tensile, 77, 213, 218  
 Delta learning rule, 165  
 Diagnostics, machine condition, 287  
 Dilatancy point, 365, 381  
 Drying characteristics, pine  
   veneer, 435  
 Dust impact process, 273

### E

Earthquakes, 347  
   preparation zone, 358  
 Elastic impact, 273  
 Elasticity, 105  
   theory, 77  
 Electromagnetic-acoustic  
   transducer, 35  
 Electron beam welding, 35  
 End-notched flexure, 395  
 Energy discriminating acoustic  
   emission method, 416  
 Erosion, 273  
   cavitation, 305  
 Event increment rate, 365  
 Expert systems, 156, 316

## F

Failure mechanisms,  
graphite/epoxy coupons, 404  
Fatigue  
crack growth, 261  
cyclic, tests, 199  
damage modes, 416  
Fiber-reinforced plastics, 123  
Film adhesive strength, 67  
Flaw size, 242  
Flight, crack detection during, 146  
Fracture, 47, 146, 218, 328, 395  
behavior, 123  
hydro-, 347  
inclusion, 77, 252  
intergranular, 261  
matrix splitting, 404  
strength, effect on flaw size, 242  
Friction emission, 404

## G

Gas cylinders, compressed, 185  
Gear, spur, 261  
Geotechnics, 347, 365  
Glass particles, impact test, 273  
Grain boundary slippage, 358  
Graphite, 252  
Graphite/epoxy composites, 404  
Green's functions, 67, 273  
dynamic, 47  
simplified, 347

## H

Hatano method, 7  
Heat transfer, 435  
Hydrogen charging, 213  
Hydrogen embrittlement, 213  
Hydrostatic test, 185  
Hydrotest, 199  
Hydroturbines, 305

## I

Imaging, ultrasonic, 86, 381  
Impact damage, 424  
Impact, elastic, 273  
Impact, particle, 273  
Impact, plastic, 273  
Inclusion fracture, 77, 252

Industrial environment, sensing, 25  
In-flight monitoring, 146  
Inspection, pressure vessel, 185,  
199  
Integrity evaluation, 156  
Intergranular fracture, 261  
Inverse problems, 47, 165  
Iron, nodular cast, 252

## J

Joule heating, 67

## L

Lamb waves, 105  
Laminates, carbon reinforced  
composites, 416  
Lead, acoustic emission signals, 7  
Line source, 67  
Lithium, aluminum-, alloys, 213  
Loading conditions, rock  
fracture, 365  
Loading, thermo-mechanical, 424  
Localization, 199  
Low strain, 358

## M

Machine condition diagnosis, 287  
Machining, 328  
Maintenance, machine, 287  
Mapping, system, 165  
Mass production products, 287  
Matrix cracking, 395  
Matrix splitting, 404  
Mechanical properties, change  
assessment, 95  
Metals, 218, 261  
coatings, 67  
films, 67  
microfracture, 47  
Microcracks, 47  
Microfracture, 47, 365, 381  
Micromechanics, 47  
Microseismics, 347, 358  
Milling, 316, 328  
Moisture content, 435  
Moment tensor analysis, 347

Monitoring  
 plant, 156, 287  
 process, 35, 165  
 tool, 316

## N

Neural networks, 165, 316, 328  
 Neural signal processing, 165  
 Nimonic alloy, 218  
 Nodular cast iron, 252  
 Nondestructive evaluation, 242  
 quantitative, 47

## O

Orowan looping, 218

## P

Particle  
 impact, 273  
 shearing, 218  
 second phase, 252  
 Pencil lead fracture method, 7  
 Pine veneer, 435  
 Plant operability  
 efficient, 287  
 monitoring, 156  
 Plastic impact, 273  
 Plastics, fiber reinforced, 123  
 Point source, 67  
 Polyetheretherketone, 395  
 Pressure vessels, 185, 199  
 Process control, 35  
 Process monitoring, 35, 165

## R

Rock, 347, 358, 365, 381  
 Root mean square, 305  
 Rotating machinery, 287

## S

Second phase particles, 252  
 Sensitivity, sensor, 7

Sensors, 328  
 electron beam welding, for, 35  
 housing, 25  
 integrated, 25  
 mounting condition, 7  
 problems with, 7  
 sensitivity, 7  
 stress wave, 25  
 transducers, 35, 47, 305  
 Shear motion, 381  
 Signal analysis, 199, 416  
 development, 95  
 Signal energy, 77  
 Signal processing, 123, 328  
 Signals, emission, 7  
 fracture, 146, 242  
 Silicon nitride, 242  
 Source characterization, 165  
 acoustic emission, 47  
 Source inversion, 347  
 Source location, 86, 347, 381  
 Source mechanism, 381  
 Splitting, matrix, 404  
 Splitting, veneer, 435  
 Spur gear, 261  
 Steel

carburized, 261  
 stainless, 218  
 Strain ageing, 218  
 Strain levels, low, 358  
 Stress concentration, 365  
 Stress induced changes, 86, 381  
 Stress, residual, 199  
 Stress-strain curve, 365  
 Stress waves, 95  
 factor, 95  
 sensing, 25  
 Structural integrity function, 156

## T

Tectonic strain, 358  
 Tensile deformation, 77, 213, 218  
 Tensile tests, 123, 395  
 Tension fatigue, 416  
 Tensor analysis, moment, 347  
 Thermal cycling, 424  
 Thermal shock tests, 199  
 Thermo-acoustic emission, 424  
 Thermoelastic generation, 67  
 Thermoelastic source, 67  
 Thermoplastic, 395

Thick film hybrid, 25  
 Thin-film testing, 67  
 Through-thickness-transverse-  
     resonance (TTTR), 105  
 Time data, synthetic arrival, 86  
 Tomography  
     difference, 381  
     passive, 86  
 Tools, cutting  
     breakage, 316  
     wear, 316, 328  
 Transducers, 47, 305  
     electromagnetic-acoustic, 35  
 Transport vessels, compressed  
     gas, 185  
 Turbines, hydro-, 305  
 Turning, 316, 328

## U

Ultrasonics, 213  
     acoustic, 95, 105

imaging, 86, 381  
 signals, 67

## V

Velocity structure, 86  
 Veneer, southern pine, 435

## W

Water, effect on acoustic  
     emission, 213  
 Wave envelope processing, 123  
 Waveform parameters, 123  
 Wave propagation, 105  
 Waves, stress, 95  
     sensing, 25  
 Wear, cutting tool, 316, 328  
 Welding, electron beam, 35