

Table of Contents

Design and Development of Lifeboats - Damage Evaluation and Repair of Composite Structures R.M. Cripps	3
Stress Analysis and Identification with Full-Field Measurements M. Grédiac	9
Knowledge of Service Loads – The Key to Structural Integrity R.A. Smith	17
Elastic-Plastic Behaviour of a Plate with a Central Hole by Photoelastic Coating Method N. Matsumoto, S. Ohtaki, M. Ohira and H. Kasayama	27
Experimental Application of the Virtual Fields Method to Elasto-Plastic Behaviour Y. Pannier, R. Rotinat, S. Avril and F. Pierron	33
Elastic-Plastic Stress Analyses by Digital Image Correlation and Nonlinear Hybrid Method K. Machida	39
Thermoelastic Stress Analysis of Nitinol Self-Expanding Stents J. Eaton-Evans, J.M. Dulieu-Barton, E.G. Little and I.A. Brown	47
A New Method of Measuring Young's Modulus for Flexible Thin Materials Using a Cantilever A. Ohtsuki	53
Tensile Testing of MEMS Materials at High Temperatures W.N. Sharpe	59
In Situ Measurement of Internal Stress in Electroless Plating by Television Holographic Interferometry S. Kakunai, H. Hayashihara, T. Sakamoto and H. Matsuda	65
Fatigue Limit Evaluations of a Complex Structure by Using Temperature Measurements O. Arnould, P. Brémond and F. Hild	71
Design of an Ultrasonic Blade for Cutting Bone A. MacBeath, A. Cardoni and M. Lucas	79
FE Simulation of Laser Ultrasonic Surface Waves in a Biomaterial Model A. L'Etang and Z.H. Huang	85
Material Identification Using a Bi-Axial Test Machine P. Flores, P. Moureaux and A.M. Habraken	91
Ultrasonic Compression Tests on Aluminium Y. Daud, M. Lucas and Z.H. Huang	99
The Application of Fine Increment Hole Drilling for Measuring Machining-Induced Residual Stresses P. Grant, J. Lord, P. Whitehead and A.T. Fry	105
Experimental Measurement of the Deformation in Hot Rolling of Aluminium 1% Mn: The Grid Technique C. Boldetti, C. Pinna, I.C. Howard and G. Gutierrez	111
Experimental and Finite Element Study of Welded T-Joints A. Wu, B.G. Mellor and S. Syngellakis	117
Residual Stresses Prediction for CO₂ Laser Butt-Welding of 304-Stainless Steel K.Y. Benyounis, A.G. Olabi and M.S.J. Hashmi	125
Mechanical Testing of Dual Alloy Inertia Friction Welded Shafts W.S. Robotham, T.H. Hyde, E.J. Williams, P. Brown, I.R. McColl and C.J. Kong	131
Influence of the Heat-Treatment Process on the Mechanical Properties and Dimensions of Multi-Filamentary Composite Nb₃ Sn Superconducting Wires D.A. Harvey, N.A. Fellows, J.F. Durodola and A. Twin	141
Thermoelastic Stress Analysis of Composite Finger Joints S.W. Boyd, J.M. Dulieu-Barton and L. Rumsey	149
Determination of the Matrix of Rigidity of a Composite Material by the Combination of Speckle Interferometry and Ultrasonic Measurements L. Toubal, M. Karama and B. Lorrain	155

Identification of the Through-Thickness Orthotropic Stiffness of Composite Tubes from Full-Field Measurements R. Moulart, S. Avril and F. Pierron	161
Investigation on the Influence of the Surface Resin Rich Layer on the Thermoelastic Signal from Different Composite Laminate Lay-Ups G. Pitarresi, A. Conti and U. Galietti	167
Load and Geometry Effect on Failure Mode Initiation of Composite Sandwich Beams E.E. Gdoutos and M.S. Konsta-Gdoutos	173
Interlaminar Shear Strength and Fractographic Evaluation with Varying Temperature and Moisture Content of Thermoplastic Composites L.A.L. Franco, M.L. de Alencastro Graça and F.S. Silva	179
Characterization of the Nonlinear Shear Behaviour of UD Composite Materials Using the Virtual Fields Method H. Chalal, S. Avril and F. Pierron	185
Characterisation of Interlaminar Shear Strength of a Unidirectional Carbon/Epoxy Laminated Composite under Impact Loading T. Yokoyama and K. Nakai	191
Spar Corner Radius Integrity for the A400M Wing T. Edwards and J. Thompson	197
Developments in RGB Photoelasticity A. Ajovalasit and G. Petrucci	205
Phase-Shifting Method with Unknown Intervals in Phase-Shifting Digital Holography T. Kita, Y. Morimoto, M. Fujigaki and T. Matui	211
Transition Saddle-Cylinder Shape of Thin Unsymmetric [0/90] Square Plates under Hygrothermal Loads: Fringe Projection Method and Variational Approach M. Gigliotti, F. Jacquemin, J. Molimard and A. Vautrin	217
Simultaneous Measurement of Out-of-Plane and In-Plane Displacements by Phase-Shifting Digital Holographic Interferometry S. Okazawa, M. Fujigaki, Y. Morimoto and T. Matui	223
Complete Two-Dimensional Principal Stress Separation by the Photoelastic Oblique Incidence Method M.N. Pacey and R.A. Tomlinson	229
Measurement of Stokes Parameters by Quarter-Wave Plate and Polarizer T. Kihara	235
Semi Empirical Stress Analysis of a Brittle Material in a Vicinity of a Stress Concentrator M. Chabaat, S. Djouder and M. Touati	243
Dissipative Behaviour of Metallic Materials in Low Stress Cyclic Loading F. Maquin and F. Pierron	253
An Experimental and Finite Element Study of the Ductile Tearing Characteristics of High-Toughness Gas Pipeline Steel S.S. Ayvar, S.H. Hashemi, I.C. Howard and J.R. Yates	259
Design of a Multi-Axial Test Specimen for Fretting Fatigue in Splined Couplings P.M. Wavish, I.R. McColl and S.B. Leen	267
Predicting the Crack Growth Behavior in a Filled Elastomer C.T. Liu, M. Yen and H.K. Ching	273
Interaction Effects of Stress Intensity Factors in Parallel Cracks under Transitional Thermal-Loads N. Teshima, T. Aoki and M. Ishida	279
An Inverse Procedure for Determining the Material Constants of Isotropic Square Plates by Impulse Excitation of Vibration M. Alfano and L. Pagnotta	287
Rolling Bearings Monitoring and Damage Detection Methodology C. Delprete, M. Milanesio and C. Rosso	293
Experimental Application of the Virtual Fields Method to the Identification of Material Properties Using Vibrating Plates A. Giraudeau, B. Guo and F. Pierron	303
A Study on Vibration-Based Damage Detection and Location in an Aircraft Wing Scaled Model I. Trendafilova	309

Experimental Determination of SEA Parameters of Stiffened Cylindrical Shell Structure P. Ramachandran and S. Narayanan	315
Locating Defects Using Dynamic Strain Analysis and Artificial Neural Networks L.H. Hernández-Gómez, J.F. Durodola, N.A. Fellows and G. Urriolagoitia-Calderón	325
High-Resolution Neutron Diffraction for Nondestructive Analysis of Residual Stresses in Polycrystalline Materials P. Mikula, P. Lukáš and M. Vrána	331
Measurement on Rotating Mechanical Component by Thermoelasticity G. Brustenga, R. Marsili, M. Moretti, J. Pirisinu and G.L. Rossi	337
Evaluation of Rugged 'Smart Patch' Fibre-Optic Strain Sensors C. Doyle, S. Quinn and J.M. Dulieu-Barton	343
On the Stiffness and the Reinforcement Effect of Electrical Resistance Strain Gauges A. Ajovalasit, L. D'Acquisto, S. Fragapane and B. Zuccarello	349
On the Feasibility of Thermoelastic Stress Analysis on Rapid Prototyping Models G. Carella, U. Galietti and D. Modugno	355
Experimental Studies of the Behaviour at High Strain Rates of Unfilled and Filled Polypropylenes N. Temimi and N. Billon	363
Measurement and Analysis of Impact Test Data for X100 Pipeline Steel S.H. Hashemi, I.C. Howard, J.R. Yates and R.M. Andrews	369
Plastic Response of Nested Systems under Static and Dynamic Loading Conditions Using FE and Experimental Techniques E. Morris, A.G. Olabi and M.S.J. Hashmi	377
Behaviour of Multi-Layered Corrugated Paperboard Cushioning Systems under Impact Loads M.A. Sek and V. Rouillard	383
Traceability of Optical Techniques for Strain Measurement E. Hack, R.L. Burguete and E.A. Patterson	391
On the Calibration of Optical Full-Field Strain Measurement Systems M.P. Whelan, E. Hack, T. Siebert, R.L. Burguete, E.A. Patterson and Q. Saleem	397
Standard Test for the Evaluation of Optical Strain Measurement Systems E.A. Patterson, M.P. Whelan, E. Hack, T. Siebert, R.L. Burguete and Q. Saleem	403
A New Measurement and Testing Procedure Based on Thermoelasticity for Motorcycle Frame Prototype Development R. Marsili, M. Moretti, J. Pirisinu and G.L. Rossi	411
Innovative Remote Video Monitoring of Railway Track Displacements D. Bowness, A.C. Lock, D.J. Richards and W. Powrie	417
Measuring the Torsional Stiffness of a Space Frame Chassis Using 3D Motion Capture Techniques C.A. Featherston, K.M. Holford, C.A. Holt, D. Manning and A. Claisse	423
Finite Element Aided Design Evolution of Composite Leaf Spring J. Hou and G. Jeronimidis	429
Measurement of the Large Strain Behaviour of Aircraft Tyre Rubber R.A.W. Mines, R.S. Birch, S. McKown and D. Karagiozova	435