

60th International Scientific Conference on Experimental Stress Analysis (EAN2022)

Olsanka, Czech Republic
6-9 June 2022

ISBN: 979-8-3313-1510-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2022) by Czech Society for Mechanics (CSM)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact Czech Society for Mechanics (CSM)
at the address below.

Czech Society for Mechanics (CSM)
Dolejskova 5
Praha 8
182 00
Czech Republic

Phone: +420 266 053 045
Fax: +420 286 587 784

csm@csm.cz

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

	Page
1 <i>Benasciutti D., Marques J.M.E.</i> Statistical Method to Deal with the Variability of Fatigue Damage in Nonstationary In-service Random Loadings	11
2 <i>Blaha D. et al.</i> Strain Measurement Using a Distributed Fiber Optic Method: Influence of Fiber Optic Installation, Strain Measurement Comparison Methods	15
3 <i>Boháčová M.</i> Theoretical and Experimental Analysis of the Dynamic Behavior of an Existing Footbridge	27
4 <i>Cézová E.</i> Methods and Means in Teaching of Experimental Methods	45
5 <i>Čapek J. et al.</i> Residual Stresses and Microstructural Parameters of Laser Hardened Railway Axles	51
6 <i>Doubrava R. et al.</i> Non Standard Experimental Procedures for Design and Verification of Thermoplastic Structure Made of Hot Forming Process	56
7 <i>Drátovská V. et al.</i> The Analysis of Fatigue Life Prediction of the Metallic Bone Plates for Osteosynthesis	63
8 <i>Dub M. et al.</i> Experimental Analysis of Construction Hoist Operating Loads	67
9 <i>Dvořák M., Jeřábek I., Pleschner D.</i> Measurement of the Axial Load of the Tapered Pin Pivot	73
10 <i>Ferfecki P. et al.</i> Experimental and Computational Modal Analysis of the Newly Designed Rotor Rig	78
11 <i>Flek J. et al.</i> Strength Analysis of the Spreader Carrier	86
12 <i>Halama R. et al.</i> Viscoplastic Behaviour of Nylon Reinforced by Short Carbon Fibres under Room Temperature	94
13 <i>Halamka J., Bartošák M.</i> Fatigue Life Prediction Using Recurrent Neural Networks and Critical Plane Approach	101

14	<i>Havlíček M. et al.</i> Design, Computational and Experimental Analysis of Tree Shear	107
15	<i>Hdaib M.Y., Petříková I., Nam T.H.</i> Finite Element Analysis of the Large-strain Viscoelastic Model for Magneto-rheological Elastomer	112
16	<i>Hejman M., Václavík J.</i> Glued Joint Strength of Hybrid Structure	119
17	<i>Horká E., Bělský P., Podstawka M.</i> Simulations of Robotic Ultrasonic Inspections of Composite Parts in RoboDK Software	125
18	<i>Hornás J. et al.</i> Material Characterization of Additively Manufactured Ti-alloy	133
19	<i>Huňady R., Fabian M., Palička P.</i> Dynamic Behaviour of 3D Printed Polymers with Respect to the Structure of Their Internal Filling	137
20	<i>Jíra A., Řehounek L.</i> Experimental Investigation of Defects of Thin 3D-printed Plates	148
21	<i>Jírová R., Pešík L., Kupka A. M.</i> Investigation of Washer Influence on Bolt Connections in Non-Ferrous and Non-Metal Constructions	153
22	<i>Kacálek P., Hermann M.</i> Design and Control of Uniaxial Testing Machine	157
23	<i>Kadlec M., Raška J., Karkulín A.</i> Experimental and Numerical Analysis of Shear Loaded Thin Composite Panel	166
24	<i>Kanaval J., Cézová E.</i> Experimental Verification of the Bolted Connection Relaxation	172
25	<i>Karkulín A., Růžek R., Doubrava R.</i> Experimental Verification and Stress Analysis of Thermoplastic Aircraft Door	176
26	<i>Kec J. et al.</i> Influence of Hydrotest on Fatigue Growth of Artificial Crack in DN800 Pipeline	184
27	<i>Kesl P., Rendlová Z.</i> Design and Optimization of Load-Bearing Steel Structure Using the Probabilistic Method SBRA	190

28	<i>Klíčová B., Richter A., Lufinka A.</i> The Experimental Analysis of the Pressure Field in Breast Implants, the Effect of Surface Structure Failure on the Biomechanical Properties in the Body	194
29	<i>Kořínek M. et al.</i> Initial Yield Locus Tracking for Stainless Steel Produced by SLM Technology	198
30	<i>Kotassková K. et al.</i> Probabilistic Reliability Assessment of Energetic Devices	202
31	<i>Kowalewski Z. L., Kopeć M., Ustrzycka A.</i> Advances in Experimental Mechanics Related to Novel Materials Tested under Monotonic and Cyclic Loading Conditions	208
32	<i>Kropík B. et al.</i> Flexural and Torsional Loading of Integrated Loop Technology Joint	219
33	<i>Krstulović-Opara L. et al.</i> Relating Digital Image Correlation and Infrared Thermography using Image to Image Translation	231
34	<i>Krystek J. et al.</i> Replacement of a Metal Fan Blade with a Composite One	235
35	<i>Kubášová K., Sedláček R., Urdžíková L.</i> The Effect of a PNNI on Mechanical Properties of Rat Skins	239
36	<i>Lobovský L. et al.</i> Analysis of Spinopelvic Fixation Techniques for Mechanical Stabilisation of Sacral Bone Injuries	243
37	<i>Lufinka A., Jandová S., Petříková I.</i> Contact Pressure Measurement System	248
38	<i>Míkula P. et al.</i> Demonstration of the Resolution Properties of the 3-axis Neutron Diffraction Setting on the Samples of Rotary Swaged WNiCo Pseudoalloy	254
39	<i>Minich R., Kepka M.</i> Knowledge Base for Evaluating the Strength and Fatigue Life of Weldments from Thin-walled Profiles Used in the Construction of Bus Bodyworks	258
40	<i>Musilová R., Václavík J.</i> An Alternative Method for Residual Stress Measurement in Railway Axles	265
41	<i>Ondrášek J.</i> The influence of Microstructures on Rolling Resistance	269
42	<i>Padevět P., Mužíková B., Bittnar P.</i> Measurement of Poisson's Ratio on the Rammed unfired Earth	281

43	<i>Petřivý Z. et al.</i> Peeling Tests of the Human Aortas under the Different Conditions	286
44	<i>Plachý T. et al.</i> Experimental Dynamic Analysis of the Footbridge over the Jesípek near Hradec Králové Using New Approach.	290
45	<i>Plachý T. et. al</i> Application of Three Different Experimental Methods for Dynamic Analysis Performed on the Railway Steel Arch Bridge	299
46	<i>Pokorný J., Návrat T., Vajdák M.</i> Measured and Calculated Stiffness and Damping Coefficients of Water-Lubricated Tilting-Pad Journal Bearing	309
47	<i>Prošek Z., Tesárek P.</i> Lightweight Gypsum-based Masonry Block: Mechanical Properties	318
48	<i>Pyrzanowski P., Stepnowski M.</i> Using the Electrical Tomography Method to Determine Damage of the Surface Layer	322
49	<i>Růžička M., et al.</i> Fatigue Life Assessment of the Agitator Mixer Shaft	328
50	<i>Rybanský D. et al.</i> Modelling and Testing of 3D Printed Flexible Structure with Spatial Pattern	332
51	<i>Ryvolová M., Bakalova T.</i> Mechanical Behavior of a Geopolymer Composite System with 3D Fibre Reinforcement	336
52	<i>Ryvolová M., Mazač M.</i> The Composite Component with Self-detection of Damage	340
53	<i>Řípa V. et al.</i> Measurement of Selected Types of Oils Properties for Conical Friction Variator	344
54	<i>Sari F., Halama R., Hajnýš J.</i> On Uniaxial Ratcheting of AlSi10Mg Prepared by SLM Technology	353
55	<i>Schmidová N. et al.</i> Monitoring of Integrated Loop Technology Joints under Flexural Loading Using CFS Attached to the Surface	360
56	<i>Skácelík R., Španiel M.</i> Measurement and FEM Simulation of Process 3d Printing by Direct Metal Laser Melting	364

57	<i>Sobotka Z. et al.</i> Identification of Constitutive Parameters of the Human Vena Saphena Magna in an Inflation-extension Experiment	368
58	<i>Ščerba B. et al.</i> Artificial Intelligence in Material Testing with Digital Image Correlation	373
59	<i>Šedek J., Vlach J., Horňas J.</i> Ply-by-Ply Model Application in Analyses of Composite Structures by Finite Elements	384
60	<i>Štádler M., Lopot F.</i> Analysis of Clinched Joints Manufacturing Residual Stress	388
61	<i>Tiutkin O., Neduzha L., Kalivoda J.</i> Numerical Analysis of the Subgrade while Strengthening with the Micropiles	394
62	<i>Trojan K. et al.</i> Investigation of Residual Stresses of Thick Laser Welded Steel Plates Using X-Ray Diffraction	399
63	<i>Václavík J. et al.</i> On-line Measurement and Analysis of the Fan Blade Stress	403
64	<i>Vaňková T. et al.</i> Tensile and Compressive Properties of 3D-printed PETG Depending on Temperature	407
65	<i>Zbončák R.</i> Finite Element Model of Functionally-oriented Fabrics Laminate	413
66	<i>Zemčík O. et al.</i> Simulation of Supercritical Bending of Cladded Pipes	423
67	<i>Zemčík R., Zuzjak L., Průcha P.</i> Vibration Tests of Sandwich Panel with Inserts before and after Thermal-vacuum Conditioning	431
68	<i>Zobal O. et al.</i> Long-term Monitoring of the Development of Temperatures in the Composition of the External Wall Realized by Dry Construction	436
69	<i>Zouhar J. et al.</i> Determination of the Johnson-Cook Material Model of EN AW 6061-T6511 with Evaluation for Grooving Machining	441
	Index of Authors	453