

Contents

Part I Machine Design

A New Stand for Fatigue Testing of Pillars	3
L. Barton	
HCR Gears in the Industrial Gearbox	7
M. Burián, M. Trochta, and J. Havlik	
Design of the Vibration Separatory Apparatus	15
M. Dub, S. Sadek, J. Hendrych, and P. Spacek	
Designing of Mixing Equipment, Reactors and Bioreactors	19
T. Jirout and D. Jiroutova	
Modern Trends in the Drive Wheelsets of Rail Vehicles	27
J. Kolar	
Scale-Up of Equipment for Thermal-Expansionary Pretreatment of Lignocelluloses	37
L. Kratky	
Should We Teach Polymeric Machine Elements as Well?	45
B. Križan	
Design of Semi-active Magnetorheological Valve	51
M. Kubík and I. Mazůrek	
Support Tools in the Development of Bearings for Wind Turbines	57
R. Madaj and R. Kohar	
Note to an Undercut Limit of Involute Gearing	63
M. Nemecek	
Assessment of Industrial Design Projects with Use of Online Evaluation System	69
M. Ondra, R. Machalek, D. Skaroupka, D. Semrad, and F. Uhlir	

Vibration Isolation Pneumatic System with a Throttle Valve	75
L. Pesik, A. Skarolek, and O. Kohl	
Development of the Assembly Set for the Logistic Transport Solution	81
R. Sásik, M. Haluška, R. Madaj, M. Gregor, and P. Grznár	
The Design of the Device for the Manufacture of Planar Filter	87
L. Sevcik	
The Structural Design of Industrial Vacuum Cleaner for Dental Laboratories	93
R. Slanina and P. Sniehotta	
Reading of Operating Values of End Effector During Goods Manipulation	99
F. Stary, V. Dynybyl, and J. Mrazek	
Building Platform for Identification of Important Parameters for 3D Printing of Huge Parts	103
M. Suransky and M. Zlebek	
On Cardan Joint: Some Special Applications	111
J. Zicha and K. Macuchova	
 Part II Tribology	
Experimental Analysis of Tribological Properties of Heat Treated Graphitic Cast Irons	117
J. Broncek, P. Fabian, M. Dzimko, and N. Radek	
The Experimental Determination of the Grease Amount to Effective Wear Reduction in the Wheel-Rail Contact	127
J. Fryza and M. Omasta	
The Effect of Friction Modifier on the Wheel-Rail Contact	133
R. Galas and M. Omasta	
Measurement Methodology of Low-Shear Viscosity of Reference Liquid Under High-Pressure	139
S. Hornak	
Modification of Tooth Flank as the Possibility of Increasing Resistance of Gearing to Pitting	145
B. Kopilakova, M. Bosansky, and J. Zapotocny	
Including the Method of Lubricant Film Thickness Measurement with the Use of the Monochromatic Interferometry to the Education of Tribology	153
D. Kostal, I. Křupka, and M. Hartl	

Frictional Properties of PVA Hydrogel	159
D. Nečas, M. Vrbka, S. Yarimitsu, K. Nakashima, Y. Sawae, P. Šperka, I. Krupka, and M. Hartl	
Effect of Sanding on Adhesion Under Oil and Water Condition Between Wheel and Rail	165
D. Smejkal	
 Part III Hydraulics – Fluid Mechanisms	
Experimental Research and Optimization of Characteristic Parameters of the Valve Plate of the Axial Piston Pump/Motor	173
R. Petrovic, M. Andjelkovic, M. Radosavljevic, and N. Todici	
The Effects of the Temperatures on the Performance of the Gas Turbine	185
A. Wahab and T. Ibrahim	
 Part IV Engineering Analyses	
Innovation of Methodological Support of Risk Analyses of Technical Products in Their Life Cycle During Their Designing	197
J. Dvorak, M. Sasiadek, and S. Hosnedl	
The Mathematical Description of Sunflower Seed's Hulling Process Using Impact Huller	203
J. Hoidekr, J. Andrus, and V. Dynybyl	
Roller Bearing Fatigue Life Calculation with Inclusion of the Fits Parameters	207
S. Hrcek and R. Kohar	
Application of Statistical Methods to Analysis of Parallel Structure of Gearbox Test Rig	215
J. Chmelar, K. Petr, and V. Dynybyl	
Driving Shaft Fracture Analysis	221
K. Kaláb	
Force Conditions at an Antibacklash Designed Gear Mechanism	227
V. Kloucek	
The Effect of Fits Stiffness on Distribution of Internal Loading in Rolling Bearings	235
R. Kohar and S. Hrcek	
Design Calculation of Spur Gear Module	243
E. Kronerova	

Application of the Bond Graphs to the Description of Technical Systems	249
Z. Matuszak	
Assessment of the Validity of Technical Elements of the Complex Structure Using Flow Streams of Energy Factors	255
Z. Matuszak	
Influence of Short-Circuit Valve on Hydraulic Recovery of Vehicle Kinetic Energy	263
Z. Nemec and J. Nevrlý	
FEM Simulations on Gears with Different Carbonized Depth	269
K. Petr, V. Dynybyl, and J. Krepela	
Numerical Simulation of Ductile Fracture	277
M. Spaniel	
Dynamic of Propulsion, New Challenges for Analysis	283
V. Zoul	
Part V Modern Material and Technology	
Corrosion in Some Iron Alloys	291
M. Khidhair and M. Hasan	
Overview on the Clinched Joint Method	299
P. Maly, V. Dynybyl, J. Sojka, and F. Lopot	
The Process of Preparation Prototypes Bearing Cages for the Durability Testing	305
P. Spišák and R. Madaj	
Part VI Optimization and Design	
Optimisation of the Geometric Design Parameters of a Five Speed Gearbox for an Automotive Transmission	313
M. Bozca	
Modification of Experimental Station AXMAT	319
J. Dvoracek, L. Komenda, and L. Nohal	
Basic Conditions of the Implementation of Extremal Regulation	325
J. Homišin and M. Moravič	
Design of a Disc Grinder for EDM Electrodes Machining	331
J. Hosek and J. Drahokoupil	
Optimized Design of the Wind Turbine's Composite Blade to Flatten the Stress Distribution in the Mounting Areas	335
P. Oganessian, I. Zhilyaev, S. Shevtsov, and J.-K. Wu	

Research of New Composites for Lightweight Construction with Low Impact on the Environment	343
M. Petrů, P. Lepsík, and Ondřej Novák	
System of Low Profile Roller Conveyors	349
F. Sary and V. Hanus	
Fiber Driven Tilting Mechanism	353
P. Svatoš, Z. Šika, M. Valášek, J. Zicha, V. Bauma, and V. Rada	
Part VII Product Innovation	
Pneumatic Dual Mass Flywheel – Damper Concept for Downspeeding	361
R. Grega and P. Baran	
Rationalising the Use of Design for Assembly as DfX Knowledge to Increase Competitiveness of Designed Technical Products	369
S. Hosnedl, M. Kopecky, and M. Sasiadek	
Materials and Sustainable Development	377
I. Mazinova and M. Bochinsky	
Part VIII Experimental Methods and Measuring	
Design of Experiment for Load Gear Solution in Planetary Transmission	385
O. Berka, F. Lopot, and M. Dub	
Investigation of Tram Gearbox Hinge Behaviour	393
M. Dub, J. Kolar, F. Lopot, V. Dynybyl, and O. Berka	
Mechanical Properties of Fasteners	399
V. Fliegel, A. Lufinka, and R. Martonka	
Mathematical Description of Non-linear Mechanical Behaviour of Materials Under Compression Loading, Case Study: Spruce Bulk Wood Chips	405
D. Herak, A. Kabutey, and R. Sigalingging	
Influence of Steel Sheet Width on Bearing Capacity of Resistance Spot Welding	411
P. Hrabě and M. Müller	
Calculation of Fuel Consumption on the Vehicle Simulation Model	417
M. Kobza	

Identification of Parameters of Stiffness and Damping Based on the Amplitude Frequency Characteristics	421
O. Kohl	
Measurements of the Integral Characteristics of Twisted Flow Using a Five-Tube Pressure Probe	427
J. Kuzel, M. Golda, M. Kral, and M. Hraska	
Method of Experimental Measurement of a Bucket in Laboratory Conditions	433
P. Kribala, V. Dynybyl, and J. Kricka	
Biaxial Stress of the Textile Car Seat Cover Tested in a Climatic Chamber	437
P. Kulhavý, N. Kovalova, R. Martonka, and J. Petrik	
Hexapod Control System Optimization	443
A. Lufinka and R. Martonka	
Integration of Light: A Way to Measure Spectral Characteristics	449
K. Macuchova	
The Equipment for Temperature Measurements Near a Gear Tooth Flank	457
M. Mazac, P. Herajn, and M. Svoboda	
Determination of Power Losses Based on the Measurement in Closed Loop Test Bench for Automotive Gearboxes	465
O. Milacek and G. Achtenova	
Experimental Measurements and Development of Agricultural Trailer	471
P. Mossoczy, R. Uhler, and P. Maly	
Deformable Mirror for High Power Lasers	475
S. Nemcova and J. Zicha	
Identification of Failures of Technical Equipment Using Acoustic Camera	483
S. Poljak and I. Gajdac	
Assessment of the Mechanical Properties the Polyurethane Foam Under Multiaxial Loading in a Different Climatic Conditions	491
P. Srb, P. Kulhavý, and R. Martonka	
Experimental Analysis of Prototype Rubber Suspension for Agricultural Machine	497
P. Syrovatka, F. Lopot, and M. Janda	

Contribution to the Methodology of Measuring Transmission Error . . . 503
M. Trochta, Z. Folta, and M. Burián

Climate Chamber for Testing of Multiaxial Loading 509
D. Vejrych, R. Martonka, and R. Kovář

Part IX Nanotechnology

System for High-Temperature Calcination of Nanofibers 515
R. Kovář

Author Index 521

Subject Index 525

The Latest Methods of Construction Design

Dynybyl, V.; Berka, O.; Petr, K.; Lopot, F.; Dub, M. (Eds.)

2016, XXVI, 528 p. 372 illus., Hardcover

ISBN: 978-3-319-22761-0