



Table of Contents

Section 1- Engineering Analyses	11
S. Andrienko ¹ , R. Protasov ² , A. Ustinenko ³ , A. Bondarenko ⁴ Research of contact stress in gears and chain drives with evolute teeth profile	13
S. Bingol ¹ , H. Y. Kilicgedik ¹ , M.S. Keskin ¹ , T. Altinbalik ² Finite Element Analysis of Hot Extrusion Process for Different Die Angles.	19
O. Dajbych ¹ Simple inverse involute function formula	25
T. Gornisiewicz ¹ , L. Komenda ² , L. Nohal ^{3,4} , P. Mazal ⁵ . Optimization of Mixer Truck Gearbox Bearings	29
S. Hrcek ¹ , R. Kohar ² , B. Krchnavy ³ The influence of distribution of load on rolling elements from the size preload of rolling bearing	37
S. Hrcek ¹ , R. Kohar ² , B. Krchnavy ³ Determining optimum preload of the roller bearings with regard to their life	45
R. Kohar ¹ , S. Hrcek ² , R. Madaj ³ , B. Krchnavy ⁴ Design basic parameters of differential hydrostatic-mechanical transmission DA-DX	51
I. Křístek ¹ , J. Havlík ² Calculation of concentration tension in part with notches	60
E. Kronerova ¹ Shaft-to-hub connection by a key	64
Z. Matuszak An example of the use of next check selection method as a diagnostic test for the system of marine power plant	69
Section 2- Experimental Methods and Measuring	75
J. Cejka ¹ , J. Mrazek ² , V. Dinybyl ³ Stabilization of Belt Conveyor	77
V. Dinybyl ¹ , M. Pasa ² , P. Syrovatka ³ Experimental measuring of resistance of several wood types using wood crusher	83

56th International Conference of Machine Design Departments
(ICMD 2015)

V. Klouček ¹ , R. Martonka ² Kinematics of hydraulic hexapod with 6 DOF	87
B. Kopiláková ¹ , M. Bošanský ² , P. Tököly ³ Determination of the Wöhler curve of C-C gearing for C60E material	93
M. Kubík ¹ , O. Macháček ² , Z. Strecker ³ , I. Mazůrek ⁴ FEM model of magnetic circuit and its verification	99
Ľ. Kučera ¹ , I. Gajdáč ² , M. Mruzek ³ Experimental analysis of the electric vehicle energy balance	105
A. Lufinka ¹ , J. Petrik ² , R. Martonka ³ Electrical Components Thermal-vibration Test	111
R. Martonka ¹ , V. Fliegel ² , A. Lufinka ³ Design of Calibrating Equipment for Force Cell	115
L. Pesik ¹ , O. Kohl ² , P. Němeček ³ Identification of the dynamic system of a machine with elastic base	120
P. Tököly ¹ , M. Bošanský ² , B. Kopiláková ³ Possible Variance of Pitting Damage Quantification with Photographic Method	126
K. Petr ¹ FEM Simulations of Gear Mesh with Respect of Surface Hardened Depth	132
M. Trochta ¹ , Z. Folta ² , M. Burián ³ New Aspects of Transmission Error Measurement	138
R. Vrána ¹ , O. Koukal ² , D. Koutný ³ , P. Krejčí ⁴ , D. Paloušek ⁵ Device for Testing Impact Resistance of Lattice Structures Panels Produced by the Selective Laser Melting	144
Section 3 – Machine Design	151
F. Borůvka ¹ , J. Vesecký ² The Quality of CAD Data - the Key to Efficient Product Development Process	153
M. Burián ¹ , M. Trochta ² , J. Havlík ³ Loading Capacity of gearbox MTC 42A	157

56th International Conference of Machine Design Departments
(ICMD 2015)

P. Heller ¹ , J. Kořínek ² , L. Tříška ³ Hybrid Body of Underground Railway Car: Path towards Reduced Weight of Rail Vehicles	163
J. Kanaval ¹ , J. Janovec ² The Legal Consequences of Fundamental Errors in the Design of Machines and Their Parts	173
M. Kepka ¹ , M. Kepka Jr. ² , L. Bartoň ³ Teaching and Research of Service Strength and Durability of Vehicles	179
R. Kohar ¹ , S. Hrcek ² , R. Madaj ³ , M. Tomasikova ⁴ Differential hydrostatic-mechanical gear DA-DX shifting in maximum power in Hydrostatic transmission	185
P. Malý ¹ , V. Dynybyl ² , J. Sojka ³ Design and Verification of Connection Realized by the Array of Clinched Joints	195
Z. Matuszak ¹ , D. Tarnapowicz ² About infrasound on maritime floating objects	199
I. Mazínová Geometrical Product Specifications - Do We Know What We Prescribe?	205
M. Němček ¹ Comments on ISO 6336 – 6	213
K. Petr ¹ , D. Hanousek ² Design of Rear Drive Car Formula Student FSE.04	219
P. Sniehotta ¹ The influence of "pseudo double helical" gearing adjustment on step contact ratio coefficient	223
R. Sovják ¹ , M. Ondra ² , M. Zdvihalová ³ Method of mock-up scanning for acceleration of design process	229
L. Sevcik ¹ Mechanical loaded protection cab ROPS of truck	233
D. Tarnapowicz ¹ , Z. Matuszak ² "Power Take Home" - Emergency ship propulsion system	239

56th International Conference of Machine Design Departments
(ICMD 2015)

D. Tarnapowicz “Power Take In” - hybrid propulsion system of the ship.....	245
V. Vanek Title of Fatigue Life Prediction of the Toothing and Internal Resources of Excitation.....	251
A.Wahab ¹ , H.Majdi ² Design of scroll compressor for air conditioning and refrigeration.....	257
M. Zdvihalová ¹ , M. Ondra ² , R. Sovják ³ Implementation of brand on industrial products.....	266
Section 4 - Modern Materials and Technology.....	273
J. Andruš ¹ , V. Dynybyl ² Carbon Caster Fork Design for Ambulatory Transportation Technology.....	275
L. Barton ¹ , P. Heller ² , M. Kepka ³ Fatigue Damage in Bodies of Railway Vehicles.....	281
S. Bingol ¹ , T. Altinbalik ² , H. Y. Kilicgedik ¹ Artificial neural network modeling for the application of lateral extrusion process.....	285
J.Kanaval Unconventional Methods of Increasing Fatigue Resistance to the Tooth Flank Pitting - Hardened Surface Modification or Coating Application.....	291
M. Khidhair ¹ , W. Khudhair ² Improvements of Mechanical Properties of Steel Type C60.....	297
C. Mizera ¹ , D. Herak ² Mechanical properties of false banana's fibre (Ensete Ventricosum).....	303
P. Kulhavy ¹ , P. Srb ¹ , M. Syrovatkova ² Methods for determining the tensile properties of a fiber composite rods.....	307
J. Oleksik ¹ , T. Vietor ² , Deformation and weight analysis of a sill made of hybrid material.....	315

M. Petru ¹ , M. Syrovatkova ² Study and analysis of mechanical parameters of the composite materials in the Barrier tests.....	321
R. Sásik ¹ , M. Hoč ² , P. Spišák ³ , R. Madaj ⁴ The comparison of the precision of prototype production by the technology Rapid Prototyping (SLM method) with the proposed CAD model.....	328
Section 5 – Tribology.....	335
J. Broncek ¹ , M. Kovalicek ² , P. Fabian ³ , R. Bastovansky ⁴ Investigation of Tribological Properties of WC/C coatings applied on 100Cr6 bearing steel substrate.....	337
J. Bucala ¹ , S. Poljak ² , M. Žarnay ³ Application of Wear Resistant Electro-Spark Deposited Coatings for Contact Surfaces of Autonomous Drilling Devices.....	343
J. Fryza ¹ , P. Sperka ² , I. Krupka ³ , M. Hartl ⁴ Behaviour of EHL Films under Lateral Vibrations.....	349
R. Galas ¹ , P. Šperka ² , M. Omasta ³ , M. Hartl ⁴ , I. Křupka ⁵ Investigation of the Lubricant Fluid-Flow in EHL Contact using Particle Tracking.....	353
A. Harlecki ¹ , A. Urbaś ² Modelling friction phenomena in dynamic analysis of spatial linkages.....	357
M. Kučera ¹ , V. Malý ² , M. Kučera ³ Analysis of the effect of experimental conditions on the geometric characteristics of the tribological node.....	363
P. Svoboda ¹ , D. Kostal ² , I. Krupka ³ Experimental Investigation of Lubrication Film Formation at Start-up of Smooth Surfaces.....	375
F. Tóth ¹ , J. Rusnák ² , M. Kadnár ³ Application of technology of thermal spraying in areas of sliding nodes.....	381
K. Kaláb Innovation study materials of the machine parts and mechanisms.....	389
M.A. Tkachuk, N. Skripenko, A. Grabovskiy, M.M. Tkachuk Numerical tools for analysis of complex-shaped bodies in mechanical.....	393