13th International Conference on Tribology (ROTRIB'16)

IOP Conference Series: Materials Science and Engineering Volume 174

Galati, Romania 22 – 24 September 2016

ISBN: 978-1-5108-3714-0

ISSN: 1757-8981

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© (2016) by the Institute of Physics All rights reserved. The material featured in this book is subject to IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact the Institute of Physics at the address below.

Institute of Physics Dirac House, Temple Back Bristol BS1 6BE UK

Phone: 44 1 17 929 7481 Fax: 44 1 17 920 0979

techtracking@iop.org

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

Table of contents

Volume 174

13th International Conference on Tribology, ROTRIB'16 22–24 September 2016, Galati, Romania

Accepted papers received: 17 January 2017

Published online: 1 March 2017

Preface

011001 OPEN ACCESS 13th International Conference on Tribology

011002 OPEN ACCESS Peer review statement

Papers

012001
OPEN ACCESS

Cylindrical roller bearings with profiled contacting surfaces

S S Creţu....1

012002 OPEN ACCESS

<u>Triboelectrical charge generated by frictional sliding contact between polymeric materials</u>

T Zeghloul, M B Neagoe, Y E Prawatya and L Dascalescu.....9

Influence of surface roughness on the tribo-electric process for a sliding contact between polymeric plate materials

M B Neagoe, Y E Prawatya, T Zeghloul and L Dascalescu.....15

012004

OPEN ACCESS

Experimental analysis of axial and radial stress distribution in soft materials used for petrochemical valve stem sealing package

R G Ripeanu, A Ispas and D Ispas....21

012005

OPEN ACCESS

Influence of tooth profile on the noncircular gear tooth contact

A Cristescu, L Andrei and B Cristescu....28

012006

OPEN ACCESS

Dynamic analysis of six-bar mechanical press for deep drawing

S Mitsi, I Tsiafis and K D Bouzakis.....37

012007

OPEN ACCESS

The effects of mechanical properties and sintering duration on the wear behaviour of silicon nitride

A Brusilová, P Švec, Z Gábrišová and M Pokusová.....45

012008

OPEN ACCESS

The effect of transport velocity upon spin torque

S Alaci, F C Ciornei, D Amarandei, L Irimescu, I C Romanu and M A Rotar.....53

Tribological behaviour of unidirectional carbon fibre-reinforced epoxy composites

Y Şahin and P De Baets.....60

012010

OPEN ACCESS

Abrasive wear of high velocity oxygen fuel (HVOF) superalloy coatings under vibration load

M Kandeva, B Ivanova, D Karastoyanov, T Grozdanova and E Assenova.....68

012011

OPEN ACCESS

Experimental research on energy losses through friction in order to increase lifetime of hydraulic cylinders

C Cristescu, R Radoi, C Dumitrescu and L Dumitrescu.....79

012012

OPEN ACCESS

Structural-energetic regularities of tribocontact evolution*

S Fedorov.....87

012013

OPEN ACCESS

The dynamic behavior of sliding tribosystems in unstable operating conditions

A Postaru, Ghe Postaru, V Ceban, C Spânu and P Stoicev.....96

012014

OPEN ACCESS

Experimental studies regarding wear processes through dry friction of the superficial layer for an unconventional treated steel

C P Papadatu.....106

A comparative study on tribological behavior between metal and polymeric composites used to repair bronze made parts in dry reciprocating sliding tests

V Iliuță, M Rîpă, J Javorova and G Andrei.....116

012016 OPEN ACCESS

Study on friction behaviour of brake shoe materials for mining hoist

M Ungureanu, N S Ungureanu and I Crăciun.....126

012017

OPEN ACCESS

Micro-scratching tests of a rolled aluminium alloy AA2024-T351 thick plate using a diamond micro-blade

E Pirva, A Tudor, A Gavrus, G Chisiu, N Stoica and A Predescu.....134

012018

OPEN ACCESS

The adhesion and hysteresis effect in friction skin with artificial materials

K A Subhi, A Tudor, E K Hussein and H S Wahad.....142

012019

OPEN ACCESS

<u>Tribological properties of the disc brake friction couple materials in the range of small and very small speeds</u>

N A Stoica, A M Petrescu, A Tudor and A Predescu.....148

012020

OPEN ACCESS

Analysis of progressive cavity pumps specific wear processes using Finnie models

M Popescu, A I Popovici, F N Petrescu and N N Antonescu.....157

The effect of friction in coulombian damper

H S Wahad, A Tudor, M Vlase, N Cerbu and K A Subhi.....164

012022

OPEN ACCESS

Analysis of progressive cavity pumps specific wear processes using Bitter and Hutchings models

A I Popovici, M Popescu, N N Antonescu and F N Petrescu.....173

012023

OPEN ACCESS

A study regarding friction behaviour of lysine and isoleucine modified epoxy matrix

I Bălan, R Bosoancă, A Căpățină, I Graur, V Bria and C Ungureanu.....180

012024

OPEN ACCESS

Comparative study regarding friction coefficient for three epoxy resins

G Mihu, I Mihalache, I Graur, C Ungureanu and V Bria.....187

012025

OPEN ACCESS

A study of friction wear behaviour of nano-ferite modified epoxy resins

C Munteniță, C Eni, I Graur, C Ungureanu and M Bodor.....191

012026

OPEN ACCESS

The determination of the thickness of the layers deposited on the electronic circuit boards through tribological methods

A M Petrescu, A Tudor, G Chişiu, N A Stoica and U Cihak Bayr.....196

012027

OPEN ACCESS

Aspects of the tribological behaviour of powders recycled from rapid steel treated sub-zero*

S Radu and M Ciobanu.....202

012028

OPEN ACCESS

<u>Investigation on the contact behaviour of MEMS micromembrane with serpentine hinges</u>

M Pustan, C Birleanu, C Dudescu and F Rusu.....208

012029

OPEN ACCESS

Analysis of the bending stiffness and adhesion effect in RF-MEMS structures

C Birleanu, M Pustan, C Dudescu, V Merie and I Pintea.....216

012030

OPEN ACCESS

Two-way coupled Reynolds, Rayleigh-Plesset-Scriven and energy equations for fully transient cavitation and heat transfer modeling

M Braun, K Pierson and T Snyder.....228

012031

OPEN ACCESS

Saturated porous layers squeezed between parallel disks in enclosed cells

I C Melciu, T Cicone and M D Pascovici....236

012032

OPEN ACCESS

<u>Performance evolution of fully and partially textured hydrodynamic journal bearings</u> lubricated with two lubricants

N Tala-ighil and M Fillon....244

012033

OPEN ACCESS

The effect of lubricant supply and frequency upon the behaviour of EHD films subjected to vibrations

R Glovnea, X Zhang and J Sugimura.....250

Tribological study of an aerodynamic thrust bearing in the supersonic regime

F. Dupuy, B. Bou-Saïd and M. Garcia.....258

012035

OPEN ACCESS

Down to the roughness scale assessment of piston-ring/liner contacts

H M Checo, A Jaramillo, R F Ausas, M Jai and G C Buscaglia.....264

012036

OPEN ACCESS

The behaviour of lubricated EHD contacts subjected to vibrations

X Zhang and R P Glovnea....274

012037

OPEN ACCESS

A finite element solution of the Reynolds equation of lubrication with film discontinuities: application to helical groove seals

M Jarray, D Souchet, Y Henry and A Fatu.....282

012038

OPEN ACCESS

Analysis of squeeze film process between non-parallel circular surfaces

A V Radulescu and I Radulescu....290

012039

OPEN ACCESS

Effects of fluid inertia and bearing flexibility on the performance of finite length journal bearing

Juliana Javorova and Vassil Alexandrov.....300

012040

OPEN ACCESS

Some considerations concerning four-ball machine testing of the polyacrylamide solutions

A C Drumeanu.....308

012041

OPEN ACCESS

Method and device for measurement of dynamic viscosity

F C Ciornei, S Alaci, D Amarandei, L Irimescu, I C Romanu and L I Acsinte.....315

012042

OPEN ACCESS

Bio and nanomaterials in tribocorrosion systems

Lidia Benea....324

012043

OPEN ACCESS

<u>Design and technology parameters influence on durability for heat exchangers tube to tubesheet joints</u>

R G Ripeanu.....336

012044

OPEN ACCESS

Porous TiO₂-ZrO₂ thin film formed by electrochemical technique to improve the biocompatibility of titanium alloy in physiological environment

L Benea, E Dănăilă and P Ponthiaux.....345

012045

OPEN ACCESS

Improving tribocorroson behaviour by electro-codeposition of TiC nano-dispersed particles with nickel as hybrid layers for energy applications

Lidia Benea, Eliza Dănăilă, Pierre Ponthiaux and Jean-Pierre Celis.....351

Numerical investigation of the effect of friction conditions to increase die life

M O Mutlu, C G Guleryuz and Z Parlar.....359

012047

OPEN ACCESS

Tribo-thermal fatigue of the steel used for the forging die construction

A C Drumeanu.....367

012048

OPEN ACCESS

Fault tree analysis of most common rolling bearing tribological failures

Aleksandar Vencl, Vlada Gašić and Blaža Stojanović.....375

012049

OPEN ACCESS

Geometric modelling of the contact point between the bushing and sprocket in chain drives

R Saulescu, R Velicu and M Lates.....385

012050

OPEN ACCESS

Penetration tests to study the mechanical tribological properties of chisel type knife

L Vlăduțoiu, G Chișiu, T Andrei, A Predescu, C Muraru and V Vlăduț.....393

012051

OPEN ACCESS

Experimental study on guide friction contribution in global power loss of a tooth chain transmission

R Velicu, R Papuc, C C Gavrila and S Popa.....401

012052

OPEN ACCESS

Studies on Tribological Behavior of Aluminum Nitride-Coated Steel*

G C Ionescu, I Nae, R G Ripeanu, A Dinita and G Stan.....408

Theoretical and experimental analysis of the lubricating system of a high speed multiplier

V G Marian, R F Mirică and T Prisecaru.....416

012054

OPEN ACCESS

Correlations of the instantaneous carrying force and pressure distribution in the case of the narrow sliding radial bearing under hard shocks*

I M Alexandrescu, R Cotețiu and D Darabă.....424

012055

OPEN ACCESS

Wear behavior of the plasma and thermal oxidized Ti-15Mo and Ti-6Al-4V alloys

I Hacisalioglu, F Yildiz, A Alsaran and G Purcek.....432

012056

OPEN ACCESS

<u>Determination of residual stresses and natural frequencies of roll-tensioned disc by a dynamic simulation of the rolling process</u>

G Skordaris, K-D Bouzakis and D Tasoulas.....441

012057

OPEN ACCESS

Evaluating lubricating capacity of vegetal oils using Abbott-Firestone curve

C Georgescu, G C Cristea, C Dima and L Deleanu.....449

012058

OPEN ACCESS

Improvement the wear behavior of low carbon steels by friction stir processing

D M Sekban, S M Aktarer, H Yanar, A Alsaran and G Purcek.....457

012059

OPEN ACCESS

Coating multilayer material with improved tribological properties obtained by magnetron sputtering

A O Mateescu, G Mateescu, M Balasoiu, G O Pompilian and M Lungu.....464

012060

OPEN ACCESS

Wear resistance of WC/Co HVOF-coatings and galvanic Cr coatings modified by diamond nanoparticles

M Kandeva, T Grozdanova, D Karastoyanov and E Assenova.....470

012061

OPEN ACCESS

Effect of friction stir processing on tribological properties of Al-Si alloys

S M Aktarer, D M Sekban, H Yanar and G Purçek.....478

012062

OPEN ACCESS

HVOF sprayed WC-CoCr coatings on aluminum: tensile and tribological properties

A Koutsomichalis, M Vardavoulias and N Vaxevanidis.....486

012063

OPEN ACCESS

Study on surface finish of AISI 2080 steel based on the Taguchi method

S Yalcinkaya and Y Şahin....496

012064

OPEN ACCESS

Increasing in the wear resistance of injection molds made of 1.2343 steel using Ti/TiN/TiCN/nc-TiCN:a-C/nc-TiC:a-C/a-C nanocomposite coating

Velko Rupetsov, Georgi Mishev, Stefan Dishliev, Viktor Kopanov, Vassiliy Chitanov, Lilyana Kolaklieva and Chavdar Pashinski.....502

A method for determining the thickness of tribological performing thin layers formed by selective transfer

Filip Ilie, Georgiana Chisiu and George Ipate.....510

012066

OPEN ACCESS

Some considerations on noise monitoring for air handling equipments

C Bujoreanu and M Benchea.....517

012067

OPEN ACCESS

Optimization of continuous triboelectrification process for polymeric materials in dry contact

Y E Prawatya, M B Neagoe, T Zeghloul and L Dascalescu.....524

012068

OPEN ACCESS

Functioning condition monitoring of industrial equipment

N S Ungureanu, A Petrovan, M Ungureanu and M Alexandrescu....531

012069

OPEN ACCESS

Conformity assessment of the measurement accuracy in testing laboratories using a software application*

A Diniță.....537