

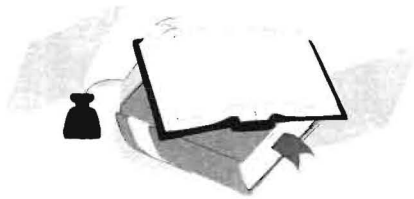


## ABSTRACTS

# SEMDOK 2016

21<sup>st</sup> International Seminar of Ph.D. Students

under the auspices of  
prof. Dr. Ing. Milan Sága  
dean of the Faculty of Mechanical Engineering of the University of Žilina



Terchová, Slovakia  
27 – 29 January, 2016

Žilinská univerzita / EDIS – Editing Centre ŽU

© Žilinská univerzita, 2016

ISBN 978-80-554-1175-0

## SEMDOK 2016

21<sup>st</sup> International Seminar of Ph.D. Students  
Terchová, 27 - 29 January, 2016  
UNIVERSITY OF ŽILINA, SK



*All published articles were reviewed by two reviewers:*

**Reviewers :**

- Belan Juraj
- Bokůvka Otakar
- Borkowski Stanislaw
- Guagliano Mario
- Hadzima Branislav
- Konečná Radomila
- Liptáková Tatiana
- Mičian Miloš
- Nový František
- Palček Peter
- Selejdak Jacek
- Tillová Eva
- Ulewicz Robert
- Zatkaliková Viera

**Note:** Authors are responsible for language contents of their papers.

## CONTENTS

<i>DETERMINATION OF COHESIVE LAW OF COLD SPRAY COATING FOR AERONAUTICAL REPAIR APPLICATIONS</i> <b>K. Petráčková, M. Guagliano</b>	7
<i>INFLUENCE OF THE SLIDING SPEED ON THE WEAR RESISTANCE OF PARTS HARD FACED BY THE HIGH-ALLOYED FILLER METAL WHICH OPERATE IN CONDITIONS WITHOUT LUBRICATION</i> <b>D. Arsić, V. Lazić, R. R. Nikolić, S. Aleksandrović, M. Djordjević</b>	8
<i>INFLUENCE OF THE CONTACT AND COMPACTING PRESSURES ON THE QUALITY OF THE FRICTION WELDED JOINT</i> <b>N. Ratković, D. Arsić, V. Lazić, R. R. Nikolić, B. Hadzima</b>	9
<i>INFLUENCE OF THE VARIABLE CONTACT PRESSURE ON THE TENSILE FORCE IN THE PROCESS OF STRIP SLIDING IN THE FLAT DIE IN IRONING</i> <b>M. Djordjević, S. Aleksandrović, R. R. Nikolić, V. Lazić, D. Arsić</b>	10
<i>CONSTRUCTION OF INDUSTRIAL FLOORS</i> <b>K. Dubala, J. Selejdak, P. Koteš</b>	11
<i>MECHANICAL PROPERTIES OF STEELS HARDOX</i> <b>M. Mazur</b>	12
<i>HODNOTENIE VPLYVU SULFIDOV NA KORÓZNU ODOLNOSŤ KONDENZÁTOROVEJ MOSADZE</i> <b>M. Lovíšek, T. Liptáková</b>	13
<i>ANALÝZA ZMIEN VNÚTORNÉHO TLMENIA V ZÁVISLOSTI OD AMPLITÚDY VÝKMITU</i> <b>Z. Dresslerová, P. Palček</b>	14
<i>ANALÝZA PREDČASNE ZLYHANEJ ENDOPROTÉZY</i> <b>M. Oravcová, P. Palček, M. Chalupová</b>	15
<i>HODNOTENIE VPLYVU TEPLoty ELEKTRODEPOZÍCIE NA KVALITU VRSTVY OKTAVÁPENATÉHO FOSFÁTU (OCP) NA HORČÍKOVEJ ZLIATINE ELEKTRON 21</i> <b>M. Omasta, B. Hadzima</b>	16
<i>POROVNANIE MECHANICKÝCH VLASTNOSTÍ VZORIEK VYROBENÝCH ZO ZLIATINY Ti6Al4V ADITÍVNou TECHNOLOGIOU SLM a DMLS</i> <b>A. Bača, R. Konečná, G. Nicoletto</b>	17
<i>ÚNAVOVÁ ŽIVOTNOSŤ NÍZKOLEGOVANEJ OCELE 40NiCrMo7 PO GULŔČKOVANÍ</i> <b>D. Závodská, M. Guagliano, O. Bokůvka, L. Trško</b>	18
<i>FEM ANALYSE CORRECTION OF S-N CURVE WITH RESPECT TO WELD IMPERFECTIONS</i> <b>J. Lago, M. Guagliano, O. Bokůvka, F. Nový</b>	19
<i>HODNOTENIE TVAROVÉHO FAKTORU EUTEKTICKÉHO KREMÍKA (B-FÁZY) V Al ZLIATINE A356 POMOCOUBRAZOVEJ ANALÝZY</i> <b>K. Borko, E. Tillová</b>	20
<i>THE MANAGEMENT OF THE PRODUCTION PROCESS IN VIEW OF NEW REQUIREMENTS OF THE STANDARD ISO 9001: 2015</i> <b>B. Balon, B. Lisiecka, E. Tillová, M. Roszak</b>	21

**Name :** SEMDOK 2016, 21<sup>st</sup> International Seminar of Ph.D. Students

**Printed :** EDIS – Editing Centre ŽU, University of Žilina,  
Slovakia, 2016

**Prepared :** University of Žilina, Slovakia  
Faculty of Mechanical Engineering  
Department of Materials Engineering

**Design :** Mgr. Alena Töröková

**ISBN 978-80-554-1175-0**

# INFLUENCE OF THE CONTACT AND COMPACTING PRESSURES ON THE QUALITY OF THE FRICTION WELDED JOINT

Nada Ratković<sup>1</sup>, Dušan Arsić<sup>1</sup>, Vukić Lazić<sup>1</sup>, Ružica Nikolić<sup>1,2\*</sup>, Branislav Hadzima<sup>2</sup>

<sup>1</sup> Faculty of Engineering, University of Kragujevac, Serbia

<sup>2</sup> Research Center, University of Žilina, Slovakia

The theoretical and experimental analyses of the friction welding pressure influence on the plastic deformation level and the quality of the friction welded joint are presented in this paper. The joint of the tempering and the High-Speed steel was realized by the friction welding. Some basic principles of the friction welding procedure are presented, as well. The objective of the paper was to relate the basic process parameters, especially the friction and compacting pressures to plastic deformation parameters, during the friction welding of two dissimilar steels, what additionally complicates both the welding procedure and its analysis.

The friction welding is a very specific and complex process, since in the joint zone material is heated and plasticized with necessary action of the multi-step pressure to realize the joint. The total deformations in the axial and the radial directions are directly dependent on the applied welding pressure. Considering that geometry and shape of the friction welded joint directly depend on the friction pressure, here are presented some basic shapes of the welded joint obtained with various pressures.

The experimental investigation was conducted on cylindrical samples made of the two steels and the analysis of experimental results served to establishing the influence of the friction and compacting pressures on changes of the steel samples dimensions and shapes.

## Keywords

*Friction welding. friction pressure. compacting pressure. HS Steel. tempered steel.*

*Welding machine*



*Friction welding process*



\*Corresponding author: ruzicarnikolic@yahoo.com