International Conference on Materials, Processing and Product Engineering 2015 (MPPE2015)

IOP Conference Series: Materials Science and Engineering Volume 119

Leoben, Austria
3 – 5 November 2015

Editors:

Sven Eck Reinhold Ebner Andreas Ludwig

ISBN: 978-1-5108-2276-4

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© (2015) 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. (2016)

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 119

International Conference on Materials, Processing and Product Engineering 2015 (MPPE2015)

3-5 November 2015, Leoben, Austria

Accepted papers received: 7 March 2016

Published online: 14 April 2016

Preface

011001 OPEN ACCESS

<u>International Conference on Materials, Processing and Product Engineering 2015</u> (MPPE2015)

S Eck, A Ludwig and R Ebner

011002 OPEN ACCESS Peer review statement

Papers

012001 OPEN ACCESS

Investigation of the influence of the chemical composition of HSLA steel grades on the microstructure homogeneity during hot rolling in continuous rolling mills using a fast layer model

M Schmidtchen, A Rimnac, P Warczok, E Kozeschnik, C Bernhard, S Bragin, R Kawalla and B Linzer pg. 1

012002

OPEN ACCESS

Modelling and simulation of randomly oriented carbon fibre-reinforced composites under thermal load

R Treffler, J Fröschl, K Drechsler and E Ladstätter pg. 9

012003

OPEN ACCESS

<u>Investigation of metallurgical phenomena related to process and product development by</u> means of High Temperature Confocal Scanning Laser Microscopy

U Diéguez-Salgado, S Michelic and C Bernhard pg. 18

012004

OPEN ACCESS

Simulation of thermos-solutal convection induced macrosegregation in a Sn-10%Pb alloy benchmark during columnar solidification

Y Zheng, M Wu, A Kharicha and A Ludwig pg. 27

012005

OPEN ACCESS

Mechanical properties of low-alloy-steels with bainitic microstructures and varying carbon content

A Weber, J Klarner, T Vogl, R Schöngrundner, G Sam and B Buchmayr pg. 35

012006

OPEN ACCESS

idRHa+ProMod - Rail Hardening Control System

L Ferro pg. 43

012007

OPEN ACCESS

Thermal Stability of Residual Stresses in Ti-6Al-4V components

A Stanojevic, P Angerer and B Oberwinkler pg. 53

012008 OPEN ACCESS

Influence of Surface Roughness in Electron Beam Welding

C. Wiednig, F. Stiefler and N. Enzinger pg. 63

012009

OPEN ACCESS

Single-asperity contributions to multi-asperity wear simulated with molecular dynamics

S J Eder, U Cihak-Bayr and D Bianchi pg. 71

012010

OPEN ACCESS

Refinement of digital image correlation technique to investigate the fracture behaviour of refractory materials

Y. Belrhiti, O. Pop, A. Germaneau, P. Doumalin, J.C. Dupré, M. Huger and T. Chotard pg. 79

012011

OPEN ACCESS

Progress in development of coated indexable cemented carbide inserts for machining of iron based work piece materials

C Czettl and M Pohler pg. 88

012012

OPEN ACCESS

Synthesis and characterization of nano-structured molybdenum-iron intermetallics by gas-solid reaction technique

A A El-Geassy and S Seetheraman pg. 96

012013

OPEN ACCESS

Thermodynamic optimization of individual steel database by means of systematic DSC measurements according the CALPHAD approach

P Presoly, J Six and C Bernhard pg. 106

012014 OPEN ACCESS

<u>Laser materials processing of complex components.</u> From reverse engineering via automated beam path generation to short process development cycles.

R Görgl and E Brandstätter pg. 114

012015

OPEN ACCESS

Fatigue crack growth threshold as a design criterion - statistical scatter and load ratio in the Kitagawa-Takahashi diagram

S. Kolitsch, H.-P. Gänser, J. Maierhofer and R. Pippan pg. 122

012016

OPEN ACCESS

Modeling of variant-interaction during bainitic phase transformation

U Ehlenbröker, R Mahnken, M Petersmann and T Antretter pg. 133

012017

OPEN ACCESS

Experimental characterisation and modelling of deformation- induced microstructure in an A6061 aluminium alloy

J F Kreyca, A Falahati and E Kozeschnik pg. 142

012018

OPEN ACCESS

<u>Characterization of the effect of cryogenic treatment on the tempering behavior of a secondary hardening high Co-Ni steel</u>

M Gruber, G Ressel, S Ploberger, S Marsoner and R Ebner pg. 147

012019

OPEN ACCESS

<u>Induction hardening: Differences to a conventional heat treatment process and optimization of its parameters</u>

A Vieweg, G Ressel, P Prevedel, P Raninger, M Panzenböck, S Marsoner and R Ebner pg. 154

012020

OPEN ACCESS

Estimation of Material Parameters in Nonlinear Hardening Plasticity Models and Strain Life Curves for CuAg Alloy

J Srnec Novak, D Benasciutti, F De Bona, A Stanojević, A De Luca and Y Raffaglio pg. 162

012021

OPEN ACCESS

Analysis of the thermo-mechanical deformations in a hot forging tool by numerical simulation

R. L-Cancelos, F. Varas, E. Martín and I. Viéitez pg. 171

012022

OPEN ACCESS

Laser-assisted metal spinning for an efficient and flexible processing of challenging materials

C Brummer, S Eck, S Marsoner, K Arntz and F Klocke pg. 181

012023

OPEN ACCESS

<u>State parameter-based modelling of microstructure evolution in micro-alloyed steel</u> during hot forming

H Buken and E Kozeschnik pg. 190

012024

OPEN ACCESS

The Crack Initiation and Propagation in threshold regime and S-N curves of High Strength Spring Steels

N Gubeljak, J Predan, B Senčič and M D Chapetti pg. 197

012025

OPEN ACCESS

Conjoint Forming - Technologies for Simultaneous Forming and Joining

P Groche, S Wohletz, A Mann, M Krech and V Monnerjahn pg. 208

012026

OPEN ACCESS

Automatic optimization of localized heat treatment for Al-Si-Mg alloys

A Ludwig and T Holzmann pg. 222

012027

OPEN ACCESS

On the modelling of microsegregation in steels involving thermodynamic databases

D You, C Bernhard, S Michelic, G Wieser and P Presoly pg. 230

012028

OPEN ACCESS

Microstructure and mechanical properties of high strength Al—Mg—Si—Cu profiles for safety parts

J A Österreicher, A Schiffl, G Falkinger and G R Bourret pg. 238

012029

OPEN ACCESS

<u>Semiconductor Film Grown on a Circular Substrate: Predictive Modeling of Lattice-Misfit Stresses</u>

E. Suhir, J. Nicolics, G. Khatibi and M. Lederer pg. 246

012030

OPEN ACCESS

Nanostructural haemocompatible coatings for the internal side of artificial blood vessels

K Trembecka-Wojciga, R Major, J M Lackner, B Butruk-Raszeja, M Sanak and B. Major pg. 256

012031

OPEN ACCESS

Silver nanoparticles influence on the blood activation process and their release to blood plasma from synthetic polymer scaffold

R Major, J M Lackner, M Sanak and B Major pg. 270