

1st International Conference on Thermo-Mechanically Graded Materials

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**1st International Conference
on Thermo-Mechanically Graded Materials**

Edited by

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Verlag Wissenschaftliche Scripten

Kaiserstrasse 32, 08209 Auerbach, Germany

info@verlag-wiss-scripten.de

www.verlag-wiss-scripten.de

ISBN: 978-3-942267-58-8

Preface

Graded product properties based on microstructural material properties that have been selectively influenced on a local basis constitute the scientific focus of the 1st International Conference on Thermo-Mechanically Graded Materials which is being held in Kassel on 29 and 30 October 2012.

The scientific basis for this conference is provided by Collaborative Research Centre CRC/Transregio 30 on this same subject, which is being sponsored by the German Research Foundation (DFG) and has been running at the TU Dortmund, the University of Paderborn and the University of Kassel since summer 2006. Transregio 30 took up what was a new subject area back then and, in the meantime, the scientific study of the manufacture of functionally graded products has gratifyingly become established internationally in a wide range of scientific communities. It was thus time for an internationally-oriented conference to be launched on the basis of Transregio 30.

The very broad range of lecture topics might appear somewhat unusual at first sight: different materials such as steel, plastics and aluminium are covered, as are production engineering, materials technology and numerical control questions. Upon closer inspection, however, this is seen to be only logical. If, in future, we wish to efficiently implement the complex tasks that a product is called upon to fulfil with limited resources, it is essential to push back the current limits of production engineering and materials technology. And it goes without saying that the new technical solutions that result from this must be mapped out in virtual terms too so as to achieve predictable results for the process and product properties.

The scientists working on Transregio 30 are convinced that their interdisciplinary cooperation - namely the highly effective linking of production engineering, materials technology, material modelling and numerical control, transcending the individual material boundaries – will lead to new solutions for functionally designed materials for the future.

One key aspect here is practical relevance. It is not the aim to come up with special solutions for niche applications but rather with production processes that can be employed on an industrial scale for high-quality products with complex properties. This steps up the demands on the research work and explains why a pronounced interdisciplinary approach was selected right from the start.

We trust that this view of the situation is reflected in the papers at the conference in October 2012. The conference proceedings that you have before you contain manuscripts both from scientists in Transregio 30 and from other working groups that are active on an international basis. The close links with industry also become clear when you take a look at the conference programme: the chairpersons for the conference are almost all representatives of eminent companies – namely, potential future users of the research results.

We trust that you will enjoy reading these conference proceedings and will gain new insights from them.

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University of Kassel

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Site spokesman
TU Dortmund University

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Table of Contents

A1	Adhesion and Tribological Behavior of Cr/CrAlN Multilayer Coatings on Thermally Sprayed Substrates for Hot Metal Forming11 <i>Wolfgang Tillmann, Fabian Hoffmann, Leif Hagen, Reiner Zielke and Norman Sievers</i> <i>TU Dortmund University, Institute of Materials Engineering, Germany</i>
A2	Residual Stresses in Flange Shafts Produced by Thermo-Mechanical Metal Forming Operations19 <i>Markus Lebsanft¹, Alexander Grüning¹, Alexander Liehr¹, Joana Rebelo Kornmeier², Wolfgang Zinn¹ and Berthold Scholtes¹</i> <i>¹ University of Kassel, Institute of Materials Engineering, Germany</i> <i>² Technische Universität München, FRM II, Germany</i>
A3	Statistically Assisted Identification of the Material and Friction Parameters for Modeling Metal Cutting Processes Using the FEA25 <i>Dirk Biermann, Stefan Hess, Marcel Tiffe, Tobias Wagner and Andreas Zabel</i> <i>TU Dortmund University, Institute of Machining Technology, Germany</i>
A4	Error Based Adaptive Galerkin Time Integration Schemes for Thermal Contact Phenomena.....31 <i>Sandra Carstens and Detlef Kuhl</i> <i>University of Kassel, Institute of Mechanics and Dynamics, Germany</i>
A5	Simulation of Transient Point Loading on Functionally Graded Materials37 <i>Christina Völlmecke, B. Emek Abali, Maria Kashtalyan and Wolfgang H. Müller</i> <i>Technische Universität Berlin, Institute of Mechanics, Germany</i>
A6	Numerical Investigations on the Flow Behavior of Steel in a Semi-solid State.....43 <i>Bernd-Arno Behrens¹, Henrik Schafstall², Anas Bouguecha¹ and Thorsten Matthias¹</i> <i>¹ Leibniz Universität Hannover, Institute of Forming Technologies and Machines, Garbsen, Germany</i> <i>² Simufact Engineering GmbH, Hamburg, Germany</i>
A7	In-situ Characterization of Solid-to-Solid Phase Transformations in Steel by Digital Image Correlation.....49 <i>Martin Joachim Holzweissig¹, Demircan Canadinc² and Hans Jürgen Maier¹</i> <i>¹ University of Paderborn, Chair of Materials Science, Germany</i> <i>² Koc University, Advanced Materials Group, Istanbul, Turkey</i>

- A8 Experimental Procedure for Monitoring the Damage Accumulation Process under Fatigue Loading in Thermo-Mechanically Treated Structures55
Tobias Stein, Frank Zeismann, Sebastian Wagener and Angelika Brückner-Foit
University of Kassel, Institute of Materials Engineering, Germany
- A9 Interaction of the Crack Tip Field with the Microstructure in a Ferritic-Martensitic Steel61
Lisa Zellmer¹, Frank Zeismann¹, Yasuko Motoyashiki-Besel¹, Angelika Brückner-Foit¹, MMasakazu Kobayashi² and Hiroyuki Toda²
¹ *University of Kassel, Institute of Materials Engineering, Germany*
² *Toyohashi University of Technology, Japan*
- A10 Interaction, Modeling and Evaluation of Process Zones for Manufacturing Chains in Research Training Group 148367
Volker Schulze, Rüdiger Pabst, Harald Meier and Julius Osterried
Karlsruhe Institute of Technology (KIT), wbk Institute of Production Science, Germany
- A11 Surface- and Subsurface-Functionalization of Monolithic Metallic Materials by Thermo-Mechanical Processes73
Ekkard Brinksmeier, Daniel Meyer, Benjamin Kolkwitz and Ralf Gläbe
Foundation Institute of Materials Science (IWT), Bremen, Germany
- A12 Adaptive Fuzzy Logic Controller for the Production of Functionally Graded Materials with Tailored Microstructural Properties79
Jörg Clobes^{1,2}, Dennis Fuß², Michael Alsmann¹, Hans-Helmut Becker¹ and Kurt Steinhoff²
¹ *Volkswagen AG, Kassel, Germany*
² *Chair of Metal Forming Technology, University of Kassel, Germany*
- A13 Evaluation of Preheating Strategies Improving the Mechanical Properties in Intermediate Areas of Functionally Graded Materials85
Dennis Fuß¹, Jörg Clobes^{1,2}, Ursula Weidig¹ and Kurt Steinhoff¹
¹ *University of Kassel, Chair of Metal Forming Technology, Germany*
² *Volkswagen AG, Kassel, Germany*
- A14 Consecutive and Simultaneous Coupling of Thermal and Deep Rolling Surface Treatments91
Anis Cherif^{1,2}, Wolfgang Zinn² and Berthold Scholtes²
¹ *Volkswagen AG, Kassel, Germany*
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A15	Coupling Algorithms for Small Strain Thermo-Viscoplasticity: Monolithic vs. Partitioned Approach	97
	<i>Patrick Erbs¹, Steffen Rothe², Alexander Düster¹ and Stefan Hartmann²</i>	
	¹ <i>Hamburg University of Technology (TUHH), Numerical Analysis with Application in Ship Technology, Germany</i>	
	² <i>Clausthal University of Technology, Institute of Mechanics, Germany</i>	
A16	Numerical Simulation of Thermal Fluid Structure Interaction using the Nonlinear Heat Equation	103
	<i>Philipp Birken¹, Tobias Gleim², Detlef Kuhl² und Andreas Meister¹</i>	
	¹ <i>University of Kassel, Institute of Mathematics, Germany</i>	
	² <i>University of Kassel, Institute of Mechanics and Dynamics, Germany</i>	
A17	Modelling and Simulation of Phase-Transformations and Plasticity in Steel	109
	<i>Richard Ostwald¹, Thorsten Bartel¹, Andreas Menzel^{1,2}, Marcel Tiffe³, Dirk Biermann³, Markus Lebsanft⁴ and Berthold Scholtes⁴</i>	
	¹ <i>TU Dortmund University, Institute of Mechanics, Germany</i>	
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	⁴ <i>University of Kassel, Institute of Materials Engineering – Metallic Materials, Germany</i>	
A18	Friction-Spinning – A New Innovative Thermal Assisted Incremental Forming Process for the Manufacture of Complex Functionally Graded Workpieces	115
	<i>Werner Homberg, Daniel Hornjak and Benjamin Lossen</i>	
	<i>University of Paderborn, Chair of Forming and Machining Technology, Germany</i>	
A19	LASER-Assisted Net-Shape Forming of a Miniature Gear Shaft with Functionally Graded Properties.....	121
	<i>Kai Hilgenberg¹, Adis Huskic², Gabriel Mienert¹ and Kurt Steinhoff¹</i>	
	¹ <i>University of Kassel, Chair of Metal Forming Technology, Germany</i>	
	² <i>Leibniz Universität Hannover, IFUM, Germany</i>	
A20	Experimental Investigations of Thermal Fluid-structure Interaction	127
	<i>Matthias Weiland¹, Matthias Berth¹, Philipp Birken³, Sandra Carstens¹, Detlef Kuhl¹, Andreas Meister³ and Olaf Wünsch²</i>	
	¹ <i>Institute of Mechanics and Dynamics, University of Kassel, Germany</i>	
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- B1 On the Thermomechanical Coupling and its Relevance
for the Modeling of Extrusion Processes of Aluminum Alloys133
Alexander Bartels and Jörn Mosler
TU Dortmund University, Institute of Mechanics, Germany
- B2 Prediction of Dynamic Grain Structure Evolution during
Hot Extrusion of EN AW-6082.....137
*Ahmet Güzel¹, Martin J. Holzweissig², Andreas Jäger¹,
A. Erman Tekkaya¹ and Hans Jürgen Maier²*
¹ *TU Dortmund University, Institute of Forming Technology and
Lightweight Constructions, Germany*
² *University of Paderborn, Chair of Materials Science, Germany*
- B3 Thermo Mechanically Processing of Age Hardenable Aluminium Alloys
and Potential of Functional Graded Light Weight Components143
Ola Jensrud
SINTEF Raufoss Manufacturing, Norway
- B4 Modeling of Transient Thermal Conditions During Selective Melting
of Thermoplastic Powder149
Maximilian Drexler, Florian Kühnlein and Dietmar Drummer
*Friedrich-Alexander-University Erlangen-Nuernberg,
Institute of Polymer Technology, Germany*
- B5 Tensile and Flexural Properties of Fused
Deposition Modeling Parts Manufactured with Ultem*9085.....157
Agnes Bagsik^{1,2}, Volker Schöppner² and Eric Klemp¹
¹ *University of Paderborn, Polymer Engineering, Germany*
² *University of Paderborn, Direct Manufacturing Center, Germany*
- B6 Manufacturing of Functionally Gradient Materials by Using Weld-Deposition.....163
Makireddypalli Adinarayanappa Somashekara and Simhambhatla Suryakumar
*Indian Institute of Technology Hyderabad,
Department of Mechanical Engineering, India*
- B7 Influence of a Fracture Mechanical Gradation on Crack Propagation169
*Britta Schramm¹, Hans Albert Richard¹, Martin Steigemann²
and Maria Specovius-Neugebauer²*
¹ *University of Paderborn, Institute of Applied Mechanics, Germany*
² *University of Kassel, Institute of Analysis and Applied Mathematics, Germany*

B8	Study on Impact Crushing Properties of High Strength Steel Sheets.....	175
	<i>Hiroshi Enjoji¹, Keiko Natori¹, Tatsuya Tanaka² and Yoshihiko Arao²</i>	
	¹ <i>Graduate School of Engineering, Doshisha University, Japan</i>	
	² <i>Faculty of Science and Engineering, Doshisha University, Kyoto, Japan</i>	
B9	FEM Modeling of Hard Turning with Consideration of Phase Transformations.....	183
	<i>Eckart Uhlmann², Rolf Mahnken¹, Ivan Mitkov Ivanov² and Chun Cheng¹</i>	
	¹ <i>University of Paderborn, Chair of Technical Mechanics, Germany</i>	
	² <i>Technical University Berlin, Institute for Machine Tools and Factory Management, Germany</i>	
B10	Self-Reinforcement of Uniaxially Stretched Polycarbonate Film	189
	<i>Volker Schöppner, Andrea Wibbeke and Miriam Sasse</i>	
	<i>University of Paderborn, Polymer Engineering, Germany</i>	
B11	Computer-Aided Planning and Optimisation of Manufacturing Processes for Functional Graded Components	195
	<i>Dirk Biermann¹, Jürgen Gausemeier², Hans-Peter Heim³, Stefan Hess¹, Marcus Petersen², Angela Ries³ and Tobias Wagner¹</i>	
	¹ <i>TU Dortmund University, Institute of Machining Technology, Germany</i>	
	² <i>University of Paderborn, Heinz Nixdorf Institute, Germany</i>	
	³ <i>University of Kassel, Institute of Materials Engineering, Germany</i>	
B12	Micromechanically Motivated Damage Model for Brittle Materials Under Thermal Shock.....	201
	<i>Dimitri Henneberg and Andreas Ricoeur</i>	
	<i>University of Kassel, Institute of Mechanics, Germany</i>	
B13	An Induced Anisotropy Model for Polymers	207
	<i>Ismail Caylak¹, Rolf Mahnken¹, Andrea Wibbeke² and Volker Schöppner²</i>	
	¹ <i>University of Paderborn, Chair of Engineering, Germany</i>	
	² <i>University of Paderborn, Polymer Engineering, Germany</i>	
B14	Parameter Identification of Adhesive Materials Using a Stochastic Model with Application to a T-Joint.....	213
	<i>Nicole Nörenberg and Rolf Mahnken</i>	
	<i>University of Paderborn, Chair of Engineering Mechanics, Germany</i>	
B15	Efficient FEM Solvers for Incompressible Nonlinear Flow Models	219
	<i>Stefan Turek, Hogenrich Damanik, Jaroslav Hron and Abderrahim Ouazzi</i>	
	<i>TU Dortmund University, Institute of Applied Mathematics, Germany</i>	

B16	Comparison of Improved FE/FV Methods in the Context of Simulating Jet Extrusion Processes	225
	<i>Ammar Al-Baldawi¹, Hogenrich Damanik², Stefan Turek² and Olaf Wünsch¹</i>	
	¹ <i>University of Kassel, Institute of Mechanics, Germany</i>	
	² <i>TU Dortmund University, Institute of Applied Mathematics, Germany</i>	
B17	Thermo-Mechanically Graded Injection Moulded Microcellular Foams.....	231
	<i>Hans-Peter Heim¹, Andrzej K. Bledzki^{1,2}, Martin Rohleder¹ and Mike Tromm¹</i>	
	¹ <i>University of Kassel, Institute of Materials Engineering, Germany</i>	
	² <i>Westpommeranian University of Technology, Szczecin, Poland</i>	
B18	Production of Structural Foams in the Injection Moulding Process with ProFoam	241
	<i>Christian Hopmann and Daniel Sander</i>	
	<i>RWTH Aachen University, Institute of Plastics Processing, Germany</i>	
B19	Influence of the Process Conditions on the Morphology-Property-Relationship of Self-Reinforced PP-Composites	247
	<i>Hans-Peter Heim, Björn Rohde and Angela Ries</i>	
	<i>University of Kassel, Institute of Materials Engineering, Germany</i>	
B20	Evaluation of Nondestructive Methods for the Characterization Self-Reinforced Polypropylene Composites	253
	<i>Norman Sievers¹, Wolfgang Tillmann¹, Christian Melchers¹, Reiner Zielke¹, Angela Ries² and Hans-Peter Heim²</i>	
	¹ <i>TU Dortmund University, Institute of Materials Engineering, Germany</i>	
	² <i>University of Kassel, Institute of Materials Engineering, Germany</i>	