

# **11th International Conference on Technology of Plasticity**

## **(ICTP 2014)**

**Procedia Engineering Volume 81**

**Nagoya, Japan  
19-24 October 2014**

**Part 1 of 3**

**Editors:**

**Takashi Ishikawa**

**Ken-ichiro Mori**

**ISBN: 978-1-63439-498-7**

**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© by Elsevier B.V.  
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact Elsevier B.V.  
at the address below.

Elsevier B.V.  
Radarweg 29  
Amsterdam 1043 NX  
The Netherlands

Phone: +31 20 485 3911  
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## PART 1

<b>Preface .....</b>	1
<i>Takashi Ishikawa, Ken-Ichiro Mori</i>	

### **KEYNOTE**

<b>Production Engineering Strategies and Metalworking at Toyota Motor Corporation .....</b>	5
<i>Tatsuro Takami</i>	
<b>Selected Processes and Modeling Techniques for Rolled Products .....</b>	18
<i>G. Hirt, S. Senge</i>	
<b>Forming of Lightweight Metal Components: Need for New Technologies .....</b>	28
<i>A. Erman Tekkaya, N. Ben Khalifa, Goran Grzanic, Ramona Höller</i>	
<b>Numerical Analysis for Microstructure Control in Hot Forming Process .....</b>	38
<i>Jun Yanagimoto, Eduardo Dupin, Jin-Shan Liu, Akira Yanagida</i>	
<b>Some Advances in Plastic Forming Technologies of Titanium Alloys .....</b>	44
<i>H. Yang, P. F. Gao, X. G. Fan, H. W. Li, Z. C. Sun, H. Li, L. G. Guo, M. Zhan, Y. L. Liu</i>	
<b>Current Status of “Dieless” Amino’s Incremental Forming .....</b>	54
<i>Masaaki Amino, Masashi Mizoguchi, Yuji Terauchi, Trent Maki</i>	
<b>Semisolid Forming of Thin Plates with Microscale Features .....</b>	63
<i>Chung Gil Kang, Chul Kyu Jin, Amir Bolouri</i>	
<b>Friction Stir Welding as an Effective Alternative Technique for Light Structural Alloys Mixed Joints .....</b>	74
<i>Fabrizio Micari, Gianluca Buffa, S. Pellegrino, Livan Fratini</i>	

### **ROLLING**

<b>Processing, Microstructures and Mechanical Properties of Ultra-high Strength Steel Sheet .....</b>	84
<i>Liqing Chen, Jianguo Huang, Yang Zhao, Hongshuang Di, Fuxian Zhu</i>	
<b>Process-structure-microstructure Relationship in Hot Strip Rolling of Steels Using Statistical Data Mining .....</b>	90
<i>Kuldeep Agarwal, Rajiv Shrivpuri, Venugopal Bonthapally</i>	
<b>Advanced Rolling Technologies for Producing Ultrafine-grain/nanostructured Alloys .....</b>	96
<i>Hailiang Yu, Kiet Tieu, Cheng Lu</i>	
<b>Enhancing Technologies of Stabilization of Mill Vibration by Mill Stabilizing Device in Hot Rolling .....</b>	102
<i>Hideaki Furumoto, Shinya Kanemori, Kanji Hayashi, Akira Sako, Tadashi Hiura, Hideki Tonaka, Sun Dale, Fan Qun, Wang Fuchen</i>	
<b>Model of Residual Stresses in Hot-rolled Sheets with Taking into Account Relaxation Process and Phase Transformation .....</b>	108
<i>Andrzej Milenin, Piotr Kustra, Roman Kuziak, Maciej Pietrzky</i>	
<b>Optimization of Mechanical Properties of Low Carbon Bainitic Steel Using TMCP and Accelerated Cooling .....</b>	114
<i>Xiangwei Kong, Liangyun Lan</i>	
<b>Computer Simulation of Deformation Behavior of Non-metallic Inclusion in Hot-rolling .....</b>	120
<i>Nozomi Matsuoka, Motoki Terano, Takahiro Ishiguro, Eiji Abe, Nobuki Yukawa, Takashi Ishikawa, Yoshiyuki Ueshima, Kenichi Yamamoto, Kohichi Isobe</i>	
<b>Evaluation of Deformation Behavior of Oxide Scale in Hot Rolling Process by Vacuum Hot Rolling Mill .....</b>	126
<i>Takuya Kurotsu, Akio Segawa</i>	
<b>Finite Element Modeling of Edge Defect Formation in Plate Rolling .....</b>	132
<i>Alexander Pesin, Denis Pustovoytov</i>	
<b>Understanding and Modeling of Void Closure Mechanisms in Hot Metal Forming Processes: A Multiscale Approach .....</b>	137
<i>Michel Saby, Marc Bernacki, Pierre-Olivier Bouchard</i>	
<b>Dependence of Grain Size on Mechanical Properties and Microstructures of High Manganese Austenitic Steel .....</b>	143
<i>Xiaoyun Yuan, Liqiang Chen, Yang Zhao, Hongshuang Di, Fuxian Zhu</i>	
<b>High Efficiency Warm-cold Rolling Technology of Fe-6wt%Si Alloy Sheets .....</b>	149
<i>Jianxin Xie, Hongjiang Pan, Huadong Fu, Zhihao Zhang</i>	
<b>Flattening of Surface Grooves in Cold Flat Rolling .....</b>	155
<i>Hiroshi Utsunomiya, Tsuyoshi Ito, Ryo Matsumoto</i>	
<b>Prediction of Surface Roughness on Rolled Sheet by Texture Roll .....</b>	161
<i>Yasuyuki Fujii, Yasushi Maeda, Ryota Ifuku</i>	
<b>Roughness and Glossiness of SUS430 Stainless Steel in Cold Rolling .....</b>	167
<i>Chang-Sheng Li, Bo Fu, Tao Zhu, You-Yuan Li</i>	
<b>Simulation of Rolling Process of AZ31 Magnesium Alloy Sheet .....</b>	173
<i>Di Liu, Zuyan Liu, Lumeng Wang</i>	
<b>Deformation Characterization of Micro Rolling for Stainless Steel Foil .....</b>	179
<i>Haibo Xie, Ken-Ichi Manabe, Tsuyoshi Furushima, Kazuo Tada, Zhengyi Jiang</i>	

<b>Damage Prediction Using Several Types of Macro-scale Damage Models in Different Cold Wire Production Lines .....</b>	185
<i>Trong-Son Cao, Pierre Montmitonet, Pierre-Olivier Bouchard, Christian Bobadilla, Christophe Vachey</i>	
<b>T-bar Rolling Process with Universal and Edger Mills.....</b>	191
<i>Yukio Takashima, Naoki Nakata</i>	
<b>Quantitative Study on Mannesmann Effect in Roll Piercing of Hollow Shaft .....</b>	197
<i>Man-Soo Joun, Jangho Lee, Jae-Min Cho, Seung-Won Jeong, Ho-Keun Moon</i>	
<b>Effects of Microalloying with Lanthanum on Recrystallization of Cold Rolled Pure Copper .....</b>	203
<i>Yan Chen, Shi-Hong Zhang, Ming Cheng, Hongwu Song, Jinsong Liu, Shuangkui Xiong</i>	
<b>Rolling of AZ31 Magnesium Alloy Strip Using Induction Heating Rolls .....</b>	209
<i>Ban Cai, Changsheng Li, Jian Zhang, Yanlei Song, Jianjun Zheng</i>	
<b>Effects of Intermediate Annealing and Cold-rolling on Recrystallization Texture in 1050 Aluminum .....</b>	215
<i>Atsushi Yamamoto, Takuwa Kajitara, Masaaki Tsukamoto, Daisuke Okai</i>	
<b>Modelling of AA6082 Ductile Damage Evolution under Hot Rolling Conditions .....</b>	221
<i>Michele Francesco Novella, Andrea Ghiotti, Stefania Bruschi, Paolo Francesco Bariani</i>	
<b>Investigation on Forming Precision of Flexible Rolling Process for Three-dimensional Surface Parts of Different Sheet Materials .....</b>	227
<i>Daming Wang, Mingzhe Li, Zhongyi Cai</i>	
<b>Straightening Technology of Round Bars Using 2-roll Rotary Straightener .....</b>	233
<i>Masakazu Kato, Atsushi Hasegawa, Shoji Sugyo, Hiroshi Nakamura, Masanori Kobayashi, Yoshio Morimoto</i>	
<b>Residual Stress Around Cut End of Hat Steel Channel by Roll Forming.....</b>	239
<i>Siti Nadiah Binti Mohd Saffe, Takuo Nagamachi, Hiroshi Ona</i>	
<b>Flange Wrinkling in Flexible Roll Forming Process .....</b>	245
<i>Mohammad Mehdi Kasaeei, Hassan Moslemi Naeini, Behnam Abbaszadeh, Mehran Mohammadi, Mojtaba Ghodsi, Manabu Kiuchi, Reza Zolghadr, Gholamhosseini Liaghat, Rohollah Azizi Tafti, Mehdi Salmani Tehrani</i>	
<b>Numerical Simulation and Parameters Analysis for Roll Forming of Martensitic Steel MS980 .....</b>	251
<i>Wen Kang, Yixi Zhao, Wangwei Yu, Shanshuai Wang, Yuefeng Ma, Peijie Yan</i>	
<b>Deriving Position of Bending Roll in Roll Bending of Titanium Alloy Wire for Glasses Frame .....</b>	257
<i>Yoshinori Sasaki, Masaaki Otsu, Masami Matsumura, Kazuyuki Morishita, Taiki Tanaka, Hideki Yagi, Yuichiro Sekine, Motoo Asakawa</i>	
<b>Influence of Reduction Distribution on Internal Defects During Cross-wedge-rolling process .....</b>	263
<i>Guihua Liu, Zhiping Zhong, Zhi Shen</i>	
<b>Comparison of Semi-empirical and Dislocation Density based Material Equations for Fast Modeling of Multistage Hot Working of Steel.....</b>	268
<i>Johannes Lohmar, Markus Bambach, Gerhard Hirt</i>	
<b>Effects of Initial Forming Temperature on Primary Alpha Evolution during Radial-axial Ring Rolling for TA15 Titanium Alloy .....</b>	274
<i>Shuai Zhu, He Yang, Linggang Guo, Weijia Di</i>	
<b>Quantitative Design Methodology for Flat Ring Rolling Process .....</b>	280
<i>Wujiao Xu, Qiaoli Wang, Xue Zhou, Xiaobing Yang</i>	
<b>Effects of Key Simulation Parameters on Conical Ring Rolling Process .....</b>	286
<i>Wen Meng, Guo-Qun Zhao</i>	
<b>Influence of Feed Rate on Damage Development in Hot Ring Rolling .....</b>	292
<i>Chao Wang, Tom Van Den Boogaard, Edin Omerspahic, Viktor Recina, Bert Geijsselaers</i>	
<b>Formability Estimation of Ring Rolling Process by using Deformation Processing Map.....</b>	298
<i>Tae-Dong Kil, Jin-Mo Lee, Young-Hoon Moon</i>	
<b>Use of Image Processing to Evaluate Radial-axial Rolled Rings .....</b>	304
<i>Tobias Husmann, Horst Meier</i>	
<b>On the Origin of Specimen: Load-adapted Integral Sheet Metal Products.....</b>	310
<i>Wolfram Schmitt, Manuel Neuwirth, Felix Kretz, Peter Groche</i>	
<b>Three-dimensional Complex Tooth Profile Generated by Surface Rolling of Sintered Steel Helical Gears using Special CNC form Rolling Machine .....</b>	316
<i>Hiroshi Sasaki, Toshinaka Shinbutsu, Shuichi Amano, Teruie Takemasu, Shin-Ichiro Sugimoto, Takao Koide, Satoshi Nishida</i>	
<b>Analysis of Cross Wedge Rolling of Spiral Shaft Parts.....</b>	322
<i>Peng Wengfei, Yu Wenjing, Jiao Sjia, Shu Xuedao, Sun Baoshou, Liu Yuzhen, Zhan Lihua</i>	
<b>Metal Flow in Rotary Splitting of Circular Disk .....</b>	328
<i>Ken-Ichi Kawai, Satoshi Chaki, Yoshihiro Takayama, Yusuke Saito, Kazuhiro Ouchi, Yutaka Morishita</i>	
<b>Effect of Surface Rolling on Load Bearing Capacity of Pre-alloyed Sintered Steel Gears with Different Densities .....</b>	334
<i>Teruie Takemasu, Takao Koide, Toshinaka Shinbutsu, Hiroshi Sasaki, Yoshinobu Takeda, Satoshi Nishida</i>	
<b>Development of Bioactivity and Pull-out Torque Control Technology on Ti Implant Surface and its Application for Cold Thread Rolled Bone Screw .....</b>	340
<i>Yoshinori Yoshida, Kensuke Kuroda, Ryoichi Ichino, Norishige Hayashi, Naofumi Ogihara, Yoshio Nonaka</i>	

## **FORGING**

<b>Optimum Back-pressure Forging Using Servo Die Cushion .....</b>	346
<i>Kiichiro Kawamoto, Takeshi Yoneyama, Masato Okada, Satoshi Kitayama, Junpei Chikahisa</i>	
<b>Influence of Process Chain on Fold Formation during Flange Upsetting of Tubular Cold Forged Parts .....</b>	352
<i>Thorben Schiemann, Mathias Liewald, Claudius Beiermeister, Michael Till</i>	
<b>Influence of Forming Conditions on Loads in Split-forging.....</b>	358
<i>Ayato Mizuno, Takashi Nomura, Kazuhiko Kitamura, Keiichi Matsunaga</i>	

<b>Mechanism of Crack Initiation and Propagation in Single-side Piercing Process for Hollow Forged Parts</b>	364
<i>Takahiro Ishiguro, Eiji Abe, Nobuki Yukawa, Takahshi Ishikawa</i>	
<b>Estimation of Work-hardening Curve for Large Strain Using Friction-free Compression Test</b>	371
<i>Masaharu Usami, Tetsuo Oya</i>	
<b>Measurement of Flow Stress for Pure Aluminum up to 10 in Strain</b>	377
<i>Yasuhiro Yogo, Masatoshi Sawamura, Masafumi Hosoya, Michiaki Kamiyama, Noritoshi Iwata, Takashi Ishikawa</i>	
<b>Analytical and FEM Investigations on Boss Forming Process by Compression-drawing Method</b>	383
<i>Wenzheng Dong, Qiquan Lin, Yantao Li, Zhigang Wang</i>	
<b>A New Forming Method of Triple Cup by Plate Forging</b>	389
<i>Zhigang Wang, Yasuharu Yoshikawa</i>	
<b>Deformation Behaviour in Boss Forming by Sheet Extrusion</b>	395
<i>Kenji Hirota, Kota Michitsuji</i>	
<b>Investigations and Approaches on Material Flow of Non-uniform Arranged Cavities in Sheet Bulk Metal Forming Processes</b>	401
<i>Daniel Gröbel, Johannes Koch, Hans Ulrich Vierzigmann, Ulf Engel, Marion Merklein</i>	
<b>Multi-stage Cold Forging of Thin-walled Components</b>	407
<i>Atsuahi Danno, Sebastian Berner, Kai Soon Fong, Wai Tang Yap</i>	
<b>Method of Reducing Residual Stress Generated by Laser Cutting by Light Indentation of Sheet Metal Edge</b>	413
<i>Atsushi Maeda, Yingjun Jin, Takashi Kuboki</i>	
<b>Distribution of Plastic Anisotropy in Thickness Direction for Plate</b>	419
<i>Motoki Terano, Kazuhiko Kitamura, Shusaku Miyata, Masahiko Yoshino</i>	
<b>Prediction of Ductile Fracture in Cold Forging</b>	425
<i>Atsuo Watanabe, Shinichirou Fujikawa, Akihiko Ikeda, Noriyuki Shiga</i>	
<b>Generation of Super Smooth Surface in Compression Test</b>	431
<i>Masahito Matsui, Kouhei Toda, Kenichi Murai, Yuichi Nakamura</i>	
<b>Development of Software for Simulation of Forming Forgings</b>	437
<i>Solomonov Konstantin</i>	
<b>Contact Potential Difference Measurement of Adhesion Process during Micro/Meso-scale Injection Upsetting</b>	444
<i>Takehiko Makino, Toshinari Michimoto, Shinpei Moriyama, Tohru Kikuchi</i>	
<b>Forging Force Analysis of Truck Knuckle and Selection of Forging Equipment</b>	450
<i>Zeng Qi, Jiang Peng, Ren Xueping</i>	
<b>Hot Deformation Behavior of Fe-Mn-Al Light-weight Steel</b>	456
<i>Fu-Qiang Yang, Ren-Bo Song, Lei-Feng Zhang, Chao Zhao</i>	
<b>Formation and Mechanical Properties of Bimodal Microstructures in 0.2% Carbon Steel by Heavy-reduction Hot/Warm Compression</b>	462
<i>Hyung-Won Park, Jun Yanagimoto</i>	
<b>3D Preform Design in Forging Process based on Quasi-quipotential Field and Response Surface Methods</b>	468
<i>Yanjin Guan, Xue Bai, Mujuan Liu, Libin Song, Guoqun Zhao</i>	
<b>Prediction of Surface Crack in Hot Forging by Numerical Simulation</b>	474
<i>Hideki Kakimoto, Takefumi Arikawa</i>	
<b>Influence of Anvil Shape of Surface Crack Generation in Large Hot Forging Process</b>	480
<i>Takefumi Arikawa, Daisuke Yamabe, Hideki Kakimoto</i>	
<b>Mathematical Modeling of Critical Condition for Dynamic Recrystallization</b>	486
<i>Fei Chen, Guowei Feng, Zhenshan Cui</i>	
<b>Modeling of Heat Transfer Coefficient of Oxide Scale in Hot Forging</b>	492
<i>Nobuki Yukawa, Yoshihiro Nakashima, Takahiro Ishiguro, Eiji Abe, Takashi Ishikawa, Takashi Choda</i>	
<b>Model of Curvature of Crankshaft Blank during the Heat Treatment after Forging</b>	498
<i>Andrzej Milenin, Tomasz Rec, Wojciech Walczyk, Maciej Pietrzyk</i>	
<b>Improvement of Part or Tooling Life Prediction through Simulation of Whole Manufacturing Process</b>	504
<i>Richard Ducloux</i>	
<b>Development of Precise Load Prediction System for Free Forging of Ni-based Superalloy having Softening</b>	510
<i>Shingo Sakurai, Takuma Okajima, Masanao Fujiwara, Takuji Otake, Takashi Ishikawa</i>	
<b>Influence of Geometrical Ratios in Forgeability of Complex Shapes during Hot Forging of Ti-6Al-4V Titanium Alloy</b>	516
<i>Antonino Ducato, Gianluca Buffa, Livan Fratini, Rajiv Shivpuri</i>	
<b>Microstructure Control in Local Loading Forming of Large-scale Complex Titanium Alloy Component</b>	522
<i>Xiaoguang Fan, He Yang, Pengfei Gao</i>	
<b>Prediction of Folding Defect in Transitional Region during Local Loading Forming of Titanium Alloy Large-scale Rib-web Component</b>	528
<i>Pengfei Gao, He Yang, Xiaoguang Fan, Penghui Lei, Miao Meng</i>	
<b>Room-temperature Multi-directional Forging of AZ80Mg Alloy to Induce Ultrafine Grained Structure and Specific Mechanical Properties</b>	534
<i>Hiromi Miura, Wataru Nakamura, Masakazu Kobayashi</i>	
<b>Forging of Al-Mg Compounds and Characterization of Interface</b>	540
<i>Carolin Binotsch, Daniela Nickel, Andreas Feuerhack, Birgit Awiszus</i>	
<b>Influence of Initial State on Forgeability and Microstructure Development of Magnesium Alloys</b>	546
<i>Marcel Graf, Madlen Ullmann, Rudolf Kawalla</i>	
<b>Quantitative Analysis on Contribution of Extension Twinning to Plastic Deformation of Mg Alloy by in-situ Tracking on Grains Orientation</b>	552
<i>Guang-Sheng Song, Qiang-Qiang Chen, Shi-Hong Zhang, Yong Xu</i>	

<b>Multi-objective Optimization of Process Parameters for 7050 Aluminum Alloy Rib-web Forgings' Precise Forming based on Taguchi Method.....</b>	558
Jiansheng Zhang, Daoxiang Wu, Jie Zhou, Jing Wang	
<b>Deformation Behavior in Die Forging of Aluminum Foam Sandwich.....</b>	564
Iساو Takekoshi, Yuji Kume, Makoto Kobashi, Naoyuki Kanetake	
<b>A Method of Forming Oblique Rings.....</b>	568
Andrzej Rosochowski, Małgorzata Rosochowska, Lech Olejnik	
<b>Development of Coiled Springs with High Rectangular Ratio in Cross-section .....</b>	574
Tsubasa Tsubouchi, Kazuhito Takahashi, Takashi Kuboki	
<b>Preparation of Wood Plastic Composite Sheets by Lateral Extrusion of Solid Woods Using their Fluidity.....</b>	580
Tsunehisa Miki, Masako Seki, Soichi Tanaka, Nobuo Sobue, Ichinori Shigematsu, Kozo Kanayama	

## **EXTRUSION**

<b>Microstructure Evolution of Friction Boundary Layer during Extrusion of AA 6060 .....</b>	586
Vidal Sanabria, Soeren Mueller, Walter Reimers	
<b>Modeling of Extrusion Texture of AZ31 Magnesium Alloy with Consideration of Dynamic Recrystallization .....</b>	592
Yichuan Shao, Tao Tang, Weiqing Tang, Dayong Li	
<b>Microstructures and Properties of Extruded Al-0.6Mg-0.6Si Aluminium Alloy for High-speed Vehicle.....</b>	598
Shanglei Yang, Dongmei Zhang, Wenhai Tuo, Zhishui Yu	
<b>Approach for Predicting Formation of Fine Grain Layers in Metal Forming.....</b>	604
Sergei Alexandrov, Daria Grabko, Nguyen Minh Tuan	
<b>Effect of Extrusion Temperatures on Microstructures and Mechanical Properties of Mg-3Zn-0.2Ca-0.5Y Alloy.....</b>	610
Cheng-Jie Li, Hong-Fei Sun, Wen-Bin Fang	

## **EXTRUSION**

<b>Extrusion Behavior and Thermoelectric Properties of Bi<sub>2</sub>Te<sub>2.85</sub>Se<sub>0.15</sub> Thermoelectric Materials.....</b>	616
Zhi-Lei Wang, Kenji Matsuoka, Takehiro Araki, Takahiro Akao, Tetsuhiko Onda, Zhong-Chun Chen	
<b>Non-symmetric Hollow Extrusion of High Strength 7075 Aluminum Alloy .....</b>	622
Quang-Cherng Hsu, Yu-Liang Chen, Tsung-Hsien Lee	
<b>Effect of Die Design in Microchannel Tube Extrusion.....</b>	628
Ding Tang, Wenli Fang, Xiaohui Fan, Dayong Li, Yinghong Peng	
<b>Tube Necking Extrusion Principle and Forming Process of Trailer Rear Axle.....</b>	634
Chunguo Xu, Guangsheng Ren, Yongqiang Guo, Weiwei Ren, Ya Zhang	
<b>Formability Improvement by Die-bearing Grooves in Tube Extrusion with Spiral Inner Projections .....</b>	641
Taro Yagita, Takashi Kuboki, Makoto Murata	
<b>Flow Characteristics of Brass Rod During Continuous Extrusion .....</b>	647
Bing Li, Qi Wei, Jiu-Yang Pei, Ying Zhao	
<b>Recycling of Aluminum Chips by Hot Extrusion with Subsequent Cold Extrusion.....</b>	652
Matthias Haase, A. Erman Tekkaya	
<b>Analysis of Extrusion Welding in Magnesium Alloys – Numerical Predictions and Metallurgical Verification .....</b>	658
Nabeel Alharthi, Sedat Bingöl, Anthony Ventura, Wojciech Misiolek	
<b>Forming of Aluminum Foams by Using Rotating Mold.....</b>	664
Masanori Shiomi, Tomohiro Fukaya	
<b>Influence of Processing Parameters on Molding Process in Microcellular Injection Molding.....</b>	670
Wei Guo, Huajie Mao, Bei Li, Xiangyu Guo	

## **DRAWING**

<b>Recovery Effect in Drawing of Steel Bar for Sizing.....</b>	676
Alexey Korchunov, Gennadiy Gun, Marina Polyakova	
<b>Manufacturing of Medium Carbon Steel Wires with Improved Spheroidization by Non-circular Drawing Sequence .....</b>	682
Ho Seon Joo, Sun Kwang Hwang, Hyun Moo Baek, Yong-Taek Im, Il-Heon Son, Chul Min Bae	
<b>Optimum Die Design for Single Pass Steel Tube Drawing with Large Strain Deformation.....</b>	688
Jinn-Jong Sheu, Su-Yi Lin, Cheng-Hsien Yu	
<b>Structural Evolution of Thin Lamellar Cementite during Cold Drawing of Eutectoid Steels .....</b>	694
Gregory Gerstein, Florian Nürnberg, Włodzimierz Dudzinski, Dominika Grygier, Mirko Schaper, Andrzej Milenin	
<b>Deformation Profile in Rotary Laser Dieless Drawing Process for Metal Microtubes .....</b>	700
Tsuyoshi Furushima, Yusuke Imagawa, Shusaku Furusawa, Ken-Ichi Manabe	
<b>Improvement of Ductility of Aluminum Wire for Automotive Wiring Harness by Alternate Drawing.....</b>	706
Kazunari Yoshida, Kota Doi	

## **SHEET METAL FORMING**

<b>Bending of High-strength Low-alloyed Steel with Respect to Edge Crack Sensitivity Caused by Shearing Operations</b>	712
<i>Ioannis Tsoupis, Sven Hildering, Marion Merklein</i>	
<b>Hole Expansion Characteristics of Ultra High Strength Steels</b>	718
<i>Xinping Chen, Haoming Jiang, Zhenxiang Cui, Changwei Lian, Chao Lu</i>	
<b>Numerical Investigation of Cut-edge Effect Using Gurson-Tvergaard-Needleman Model</b>	724
<i>Xavier Lemoine, Tudor Balan, Anne-Marie Habraken</i>	
<b>Influences of Thickness Ratio of Base Sheets on Formability of Tailor Welded Blanks</b>	730
<i>Yanli Song, Lin Hua</i>	
<b>Predicting Effect of Temperature, Strain Rate and Strain Path Changes on Forming Limit of Lightweight Sheet Metal Alloys</b>	736
<i>Omer El Fakir, Liliang Wang, Daniel Balint, John P. Dear, Jianguo Lin</i>	
<b>Effect of Temperature on Stretchability of Anisotropic AZ31 Magnesium Alloy Sheet</b>	742
<i>Izumi Fukuda, Yasunori Harada, Shunpei Ohtsuka</i>	
<b>Formability and Grain Size of AZ31 Sheet in Gas Blow Forming Process</b>	748
<i>Youngseon Lee, Jae-Jung Kim, Yong-Nam Kwon, Eun Yoo Yoon</i>	
<b>Effects of Deformation Rate on Ductility of Ti-6Al-4V Material</b>	754
<i>Fengqiang Li, Jianhua Mo, Jianjun Li, Liang Huang, Wei Fan, Jinxiu Fang</i>	
<b>Effects of Anisotropic Yield Functions on Prediction of Forming Limit Diagrams of DP600 Advanced High Strength Steel</b>	760
<i>Fahrettin Ozturk, Serkan Toros, Suleyman Kilic</i>	
<b>Failure Mode and Ductility of Dual Phase Steel with Edge Crack</b>	766
<i>Xin-Cun Zhuang, Cheng Xu, Tao Wang, Zhen Zhao</i>	
<b>Effects of Temperature and Strain Rate on the Forming Limit Curves of AA5086 Sheet</b>	772
<i>Cunsheng Zhang, Xingrong Chu, Dominique Guines, Lionel Leotoing, Jie Ding, Guoqun Zhao</i>	
<b>Forming Limit Curves of Electrically Conductive Layers Printed on Sheet Metal Surfaces</b>	779
<i>Mesut Ibis, Peter Groche</i>	
<b>Dynamic Ductility and Fragmentation for Aluminum Alloy Using Electromagnetic Ring Expansion</b>	787
<i>Huijuan Ma, Liang Huang, Mengqiu Wu, Jianjun Li</i>	
<b>Electromagnetic Forming Processes: Material Behaviour and Computational Modelling</b>	793
<i>François Bay, Anne-Claire Jeanson, Jose Alves Zapata</i>	
<b>Electromagnetic Pulse Assisted Progressive Deep Drawing</b>	801
<i>Jinxiu Fang, Jianhua Mo, Jianjun Li, Xiaohui Cui, Suo Fan</i>	
<b>Bulging of 1420 Al-Li alloy based on Pulse Current</b>	808
<i>Qi Xiong, Xiao-Tao Han, Quan-Liang Cao, Zhi-Peng Lai, Qi Chen, Tao Niu, Zhong-Yu Zhou, Hong-Liang Hou, Liang Li</i>	
<b>Deep Drawing of Cylindrical Cup Using Incremental Electromagnetic Assisted Stamping with Radial Magnetic Pressure</b>	813
<i>Xiaohui Cui, Jianhua Mo, Jinxiu Fang, Jianjun Li</i>	
<b>Improvement of Formability for Multistage Deep Drawing of Ti-15V-3Cr-3Sn-3Al Alloy Sheet</b>	819
<i>Yasunori Harada, Yutaro Maeda, Minoru Ueyama, Izumi Fukuda</i>	
<b>Multi-stage Stamping Including Thickening of Corners of Drawn Cup</b>	825
<i>Yohei Abe, Ken-Ichiro Mori, Takumi Ito</i>	
<b>Analysis of High Speed Bending Operations as Basis for Integrating Self-correcting Components to Increase Process Reliability</b>	831
<i>Ulf Damerow, Mikhail Borzykh, Dmitri Tabakajew, Waldemar Schaermann, Werner Homberg, Ansgar Trächtler</i>	
<b>Forming of Ellipse Heads of Large-scale Austenitic Stainless Steel Pressure Vessel</b>	837
<i>Hui Wang, Jie Zhou, Yan Luo, Peng Tang, Youliang Chen</i>	

## **PART 2**

<b>Correction of Eccentricity between Punch and Die in Slight Clearance Punching of Ultra-high Strength Steel Sheets</b>	843
<i>Hasnulhadi Jaafar, Ken-Ichiro Mori, Yohei Abe</i>	
<b>Effect of Two-layer Simple Die on Braille Embossability to Boxboard</b>	849
<i>Norio Takatsuji, Koutarou Shiraishi, Tetuo Yanase</i>	
<b>Effect of Thermoplastic Binder on Flow Deformation Behavior of Wood</b>	855
<i>Masako Seki, Tsunehisa Miki, Soichi Tanaka, Ichinori Shigematsu, Kozo Kanayama</i>	
<b>Change of Hardness of Copper Sheet by Splitting Process</b>	861
<i>Akira Kurumada, Goroh Itoh, Masamichi Sugita, Takaaki Sakuma, Masakatsu Seki</i>	
<b>Numerical Simulation of Stress Peen Forming with Regular Indentation</b>	867
<i>Xudong Xiao, Yongjun Wang, Wei Zhang, Junbiao Wang, Shengmin Wei</i>	
<b>Deep Drawing Characteristics of Square Cups through Conical Dies</b>	873
<i>Mohsen Hassan, Labib Hezam, Mohamed El-Sebaie, Juhda Purbolaksono</i>	
<b>Formability of Pure Titanium Sheet in Square Cup Deep Drawing</b>	881
<i>Yasunori Harada, Minoru Ueyama</i>	
<b>Analysis of Earring in Circular-shell Deep-drawing of bcc and hcp Sheet Metals</b>	887
<i>Tetsuro Ohwue, Yoshikazu Kobayashi</i>	

<b>Deep Drawing with High-pressured Water jet Using Ditch-engraved Die .....</b>	893
<i>Yuki Horikoshi, Takashi Kuboki, Makoto Murata, Kazumi Matsui, Makoto Tsubokura</i>	
<b>Elliptical Redrawing from Circular and Elliptical Cups .....</b>	899
<i>Heng-Sheng Lin, Jian-Min He</i>	
<b>Deep Drawing with Superimposed Low-frequency Vibrations on Servo-screw Presses.....</b>	905
<i>Sebastian Kriechenbauer, Reinhard Mauermann, Peter Muller</i>	
<b>Effect of Pre-bulging on Wrinkling of Curved Surface Part by Hydromechanical Deep Drawing.....</b>	914
<i>Wei Liu, Yongchao Xu, Shijian Yuan</i>	
<b>Deformation-induced Martensitic Transformation and Workhardening of Type 304 Stainless Steel Sheet During Draw-bending.....</b>	921
<i>Eiichiro Ishimaru, Hiroshi Hamasaki, Fusahito Yoshida</i>	
<b>Improvement in Prediction Accuracy by Finite Element Methods of Stretch-formed Aluminum Alloy Sheets with a Large Aspect Ratio .....</b>	927
<i>Sosuke Sasaki, Akira Kono, Susumu Takahashi</i>	
<b>Observations of Cyclic Deformation Behaviors of Aluminum Sheet and Constitutive Modeling.....</b>	933
<i>Takeshi Uemori, Satoshi Sumikawa, Tetsuo Naka, Fusahito Yoshida</i>	
<b>Properties and Application of High-manganese TWIP-steels in Sheet Metal Forming .....</b>	939
<i>Christian Busch, Ansgar Hatscher, Manuel Otto, Stefan Huinink, Milan Vucetic, Christian Bonk, Anas Bouguecha, Bernd-Arno Behrens</i>	
<b>Effect of Mesh Size on Calculation of Strain Non-uniformity Index in Drawn Sheet Metal Parts .....</b>	945
<i>Prashant P. Date</i>	
<b>Energy Absorption Performance of Press-formed Shell.....</b>	951
<i>Zubair Bin Khalil, Minoru Yamashita, Yusuke Kuno, Toshio Hattori</i>	
<b>A Novel Technology to Eliminate U-bending Springback of High Strength Steel Sheet by Using Additional Bending with Counter Punch .....</b>	957
<i>Komgrit Lawanwomg, Hiroshi Hamasaki, Ryutaro Hino, Fusahito Yoshida</i>	
<b>Effect of Punch Speed on Amount of Springback in U-bending Process of Auto-body Steel Sheets .....</b>	963
<i>Min Kuk Choi, Hoon Huh</i>	
<b>Bauschinger Effect During Unloading of Cold-rolled Copper Alloy Sheet and its Influence on Springback Deformation after U-bending .....</b>	969
<i>Hiroshi Hamasaki, Yasuhiro Hattori, Kingo Furukawa, Fusahito Yoshida</i>	
<b>Springback Analysis of High Strength Dual-phase Steels .....</b>	975
<i>Miklós Tisza, Zsolt Lukács</i>	
<b>Springback of Extruded 2196-T8511 and 2099-T83 Al-Li Alloys in Stretch Bending .....</b>	981
<i>Tianjiao Liu, Yongjun Wang, Jianjun Wu, Xiaojiao Xia, Wei Wang, Shunhong Wang</i>	
<b>U-draw Bending of DP780 in Non-conventional Drawing Mode Using Direct-drive Digital Servo-press .....</b>	987
<i>Omid Majidi, Myoung-Gyu Lee, Frederic Barlat</i>	
<b>Analytical Approach of Springback of Arced Thin Plates Bending .....</b>	993
<i>Tian-Xia Zou, Ji-Yuan Xin, Da-Yong Li, Qiang Ren</i>	
<b>Springback Analysis in Air Bending Process through Experiment based Artificial Neural Networks .....</b>	999
<i>Özgür Senol, Volkan Esat, Haluk Darendeliler</i>	
<b>Springback Prediction of High-strength Steels in Large Radius Air Bending Using Finite Element Modeling Approach .....</b>	1005
<i>Vitalii Vorkov, Richard Aerens, Dirk Vandepitte, Joost R. Duflou</i>	
<b>Numerical Study on Springback with Size Effect in Micro V-bending .....</b>	1011
<i>Zhi Fang, Haina Lu, Dongbin Wei, Zhengyi Jiang, Xianming Zhao, Xiaoming Zhang, Di Wu</i>	
<b>Determination of Optimal Conditions for Gas Forming of Aluminum Sheets .....</b>	1017
<i>Sergey A. Aksenov, Eugene N. Chumachenko, Aleksey V. Kolesnikov, Sergey A. Osipov</i>	
<b>Design Optimization of Sheet Metal Stamped Parts by CAE Simulation and Back-propagation Neural Network .....</b>	1023
<i>Siyang Li, Zhongning Guo, Siyuan Cheng, Xiaowei Zhang</i>	
<b>Variation of Lubrication Condition during Sheet Hydroforming .....</b>	1029
<i>Takayuki Hama, Keisuke Kojima, Yoshihiko Nishimura, Hitoshi Fujimoto, Hirohiko Takuda</i>	
<b>Blank Hydroforming Using Granular Material as Medium-investigations on Leakage .....</b>	1035
<i>Martin Grüner, Tobias Gnibl, Marion Merklein</i>	
<b>Evolution of Microstructure and Properties of 2196 Al-Li Alloy Induced by Shot Peening .....</b>	1043
<i>Bao Long Sun, Yong Jun Wang, Jing Yi Xiao, Guo Qiang Gao, Ming Jie Qiao, Xu Dong Xiao</i>	
<b>Flow Behaviour of 2024 Aluminium Alloy Sheet during Hot Tensile and Compressive Processes .....</b>	1049
<i>Lei Deng, Ting Zhao, Junsong Jin, Xinyun Wang</i>	
<b>Measurement of Full-field Ductile Damage based on Resistance Method .....</b>	1055
<i>Zhang Saijun, Zhou Chi, Xia Qinxiang, Chen Songmao</i>	
<b>Sheet Stamping Formability Test System based Servo Crank Press .....</b>	1061
<i>Yanggen Cao, Xuelin Du, Yu Su, Wanpeng Dong, Peiran Deng, Qinchao Ruan</i>	
<b>Influence of Axial Length and Cross-sectional Shape on Axially Compressed Aluminum Polygonal Tube .....</b>	1067
<i>Makoto Miyazaki, Masashi Yamaguchi</i>	
<b>Propagation Behavior of Ultrasonic Wave around Boundary Surfaces of Workpieces and Dies .....</b>	1073
<i>Naoto Hagino, Junichi Endou, Masao Ishihama, Seiji Komiya, Shunji Katoh</i>	
<b>Determination of Biaxial Flow Stress Using Frictionless Dome Test .....</b>	1079
<i>Adam Groseclose, Hyun-Sung Son, Jim Dykeman, Taylan Altan</i>	
<b>Designing Gas Pressure Profiles for AA5083 Superplastic Forming.....</b>	1084
<i>Firas Jarrah</i>	

<b>Microstructure Evolution of Ti-6Al-4V during Superplastic-like Forming .....</b>	1090
<i>Mei-Ling Guo, Jun Liu, Ming-Jen Tan, Beng-Wah Chua</i>	

## **SHEARING**

<b>Numerical and Experimental Determination of Cut-edge after Blanking of Thin Steel Sheet of DP1000 within Use of Stress based Damage Model.....</b>	1096
<i>Bernd-Arno Behrens, Anas Bouguecha, Milan Vucetic, Richard Krimm, Tobias Hasselbusch, Christian Bonk</i>	
<b>Simulation of Stationary Crack during Blanking Using Node Separation Method.....</b>	1102
<i>Kazutake Komori</i>	
<b>Finite Element Simulation of Effect of Part Shape on Forming Quality in Fine-blanking Process.....</b>	1108
<i>Yanxiong Liu, Lin Hua, Huajie Mao, Wei Feng</i>	
<b>Precision Piercing and Blanking of Ultrahigh-strength Steel Sheets.....</b>	1114
<i>Masao Murakawa, Manabu Suzuki, Tomio Shionome, Fumitoshi Komuro, Akira Harai, Akira Matsumoto, Nobuhiro Koga</i>	
<b>Compressive and Shear Responses of Shaped-sheet Pyramidal Truss Core for Reinforced Sandwich Structure .....</b>	1121
<i>Sung-Uk Lee, Dong-Hyo Lee, Eun-Ho Lee, Dong-Yol Yang</i>	
<b>Influence of Pre-hole Shearing Condition on Formability in Hole Expansion Utilizing Simplified Opposite Die Shearing Process .....</b>	1127
<i>Kozoh Katoh, Kazuyoshi Kondo, Satoru Nakamura, Tohru Kakita, Tokiyasu Yogo</i>	
<b>Flanging Using Step Die for Improving Fatigue Strength of Punched High Strength Steel Sheet .....</b>	1133
<i>Purwo Kadarno, Ken-Ichiro Mori, Yohei Abe, Tatsuro Abe</i>	
<b>Measurement of Rollover in Double-sided Shearing Using Image Processing and Influence of Clearance .....</b>	1139
<i>Masahiro Sasada, Taiki Togashi</i>	
<b>Effect of Mechanical Conditions on Cutting Characteristics of Polycarbonate Sheet Subjected to Straight Punch/Die Shearing .....</b>	1145
<i>Pusit Mitsomwang, Shigeru Nagasawa</i>	
<b>Non-uniform Fracture in Three-stage Forming Process of Sheared Protrusion for Current Collector of Molten Carbonate Fuel Cells.....</b>	1151
<i>Chang-Whan Lee, Dong-Yol Yang</i>	
<b>Development of Closed Extruding Fine Blanking Technology.....</b>	1157
<i>Ming Deng, Yi-Long Ma, Lin Lv</i>	

## **POWDER FORMING**

<b>Effect of Powder Shape and Size on Mechanical Properties of Al Thin Plate Formed by Compression Shearing Method at Room Temperature .....</b>	1163
<i>Noboru Nakayama, Masaomi Horita, Shota Sakagami, Hiroyuki Miki, Takamichi Miyazaki, Hiroyuki Takeishi</i>	
<b>Consolidation of Cr-Cu/Cu Powder Laminated Material by Compressive Torsion Processing.....</b>	1169
<i>Wataru Kimura, Yuji Kume, Makoto Kobashi, Naoyuki Kanetake</i>	
<b>Densification Behavior of Different Metal Powders by Compression and Shear Combined Loading .....</b>	1175
<i>Suguru Kondo, Yuji Kume, Makoto Kobashi, Naoyuki Kanetake</i>	
<b>Finite Element Simulation of Powder Compaction via Shock Consolidation Using Gas-gun System.....</b>	1180
<i>Wooyeol Kim, Dong-Hyun Ahn, Lee Ju Park, Hyoung Seop Kim</i>	
<b>Injection Molding Using Only 200 °C Steamed Bamboo Powder by Controlling Metal Mold Temperature .....</b>	1186
<i>Shohei Kajikawa, Takashi Iizuka</i>	
<b>Effect of Process Parameters on Microstructure of TiAl Alloy Produced by Electron Beam Selective Melting .....</b>	1192
<i>Wenjun Ge, Chao Guo, Feng Lin</i>	

## **MATERIAL MODELING**

<b>Microstructure Evolution and Flow Localization Characteristics of 5A06 Alloy in High Strain Rate Forming Process .....</b>	1198
<i>Siliang Yan, He Yang, Hongwei Li, Xuan Yao</i>	
<b>Constitutive Model for Multi-phase High Strength Steels.....</b>	1204
<i>Wenjiao Dan, Weigang Zhang, Fei Liu</i>	
<b>Material Model based on Non-associated Flow Rule with Higher-order Yield Function for Anisotropic Metals .....</b>	1210
<i>Tetsuo Oya, Jun Yanagimoto, Koichi Ito, Gen Uemura, Naomichi Mori</i>	
<b>A Model of Anisotropy Evolution of Sheet Metals .....</b>	1216
<i>Fusahito Yoshida, Hiroshi Hamasaki, Takeshi Uemori</i>	
<b>Influence of Temper Rolling on Tensile Property of Low Carbon Steel Sheets by Application of Hill 48 Anisotropic Yield Criterion .....</b>	1222
<i>Davoud Jafarlou, Mohsen Hassan, Noor Azizi Mardi, Erfan Zalnezhad</i>	
<b>Material Modelling and Springback Analysis for Multi-stage Rotary Draw Bending of Thin-walled Tube Using Homogeneous Anisotropic Hardening Model .....</b>	1228
<i>Juan Liao, Xin Xue, Frederic Barlat, Jose Gracio</i>	
<b>A New Model Describing Plastic Distortion Fully Coupled with Ductile Damage.....</b>	1234
<i>Zhenming Yue, Houssem Badreddine, Khemais Saanouni</i>	

## **MATERIAL MODELING**

<b>Plastic Deformation and Metallurgical Evolution Modelling for Defects Reduction and Quality Optimization</b>	1240
<i>Tommaso Coppola, Filippo Dionisi Vici, Arianna Gotti, Luigi Langellotto, Sandro Notargiacomo</i>	
<b>Forming Limit Analyses of Cold Rolled IF Steel Sheet Using Differential Work Hardening Model</b>	1246
<i>Tomoyuki Hakoyama, Toshihiko Kuwabara</i>	
<b>Analysis and Experiment of 7075 Aluminum Alloy Tensile Test</b>	1252
<i>Dyi-Cheng Chen, Ci-Syong You, Fu-Yuan Gao</i>	
<b>Microstructure Simulation of 2519 Aluminum Alloy in Multi-pass Hot Compression Process</b>	1259
<i>Qiquan Lin, Wenzheng Dong, Yantao Li, Hui Zhang, Zhigang Wang</i>	
<b>Simulation of Composite Hot Extrusion with High Reinforcing Volumes</b>	1265
<i>Martin Schwane, Teresa Citrea, Christoph Dahnke, Matthias Haase, Noaman Ben Khalifa, A. Erman Tekkaya</i>	
<b>Formability of Sn-containing Ferrite Stainless Steel Sheet</b>	1271
<i>Jing-Yuan Li, Fei Fang, Di-Xuan Su, Shuai Zhang, Yu-Lai Chen</i>	
<b>High Temperature Deformation Behavior and Constitutive Modelling for 05Cr17Ni4Cu4Nb Stainless Steel</b>	1277
<i>Yanhong Xiao, Zhenshan Cui, Hongbin Yin, Cheng Guo</i>	
<b>Influence of Pearlite Interlamellar Spacing on Strain Hardening Behaviour in Spring Steel 60Si2MnA</b>	1283
<i>Chao-Lei Zhang, Xiang Liu, Le-Yu Zhou, Ya-Zheng Liu</i>	
<b>Identification of Strain Hardening Phenomena in Sheet Metal at Large Plastic Strains</b>	1288
<i>Sam Coppeters, Kazuhiko Ichikawa, Toshihiko Kuwabara</i>	
<b>Features of Unloading and Re-loading Processes of Medium Carbon Steel after Uniaxial Plastic Strain</b>	1294
<i>Dongdong Li, Masayoshi Akiyama</i>	
<b>Numerical Simulation of the Mechanical Response During Strain Path Change: Application to Zn Alloys</b>	1300
<i>Marina Borodachenkova, Wei Wen, Frédéric Barlat, António Pereira, José Grácio</i>	
<b>Microstructure Development and Mechanical Properties of Medium Carbon Carbide-free Bainite Steels</b>	1306
<i>Mohamed Soliman, Heinz Palkowski</i>	
<b>Modelling of Uniform Micron-sized Metal Particles Production Using Harmonic Mechanical Excitation</b>	1312
<i>Jun Luo, Fang Yang, Songyi Zhong, Lehua Qi</i>	
<b>Prediction of Transient Hardening after Strain Path Change by a Multi-scale Crystal Plasticity Model with Anisotropic Grain Substructure</b>	1318
<i>Philip Eyckens, Albert Van Bael, Jaap Moerman, Henk Vegter, Paul Van Houtte</i>	
<b>Influence of Repeated Shear Strain on Recrystallization of Iron Sheet</b>	1324
<i>Yuji Hiroseawa, Motoki Terano, Masahiko Yoshino</i>	
<b>Stress-strain Response for Twinning-induced Plasticity Steel with Temperature</b>	1330
<i>Fei Liu, Weigang Zhang, Wenjiao Dan</i>	
<b>Cold Formability of 22SiMnCrB TRIP-aided Martensitic Sheet Steel</b>	1336
<i>Junya Kobayashi, Hiroki Tonegawa, Koh-Ichi Sugimoto</i>	
<b>Plane Strain Compression Test and Simple Shear Test of Single Crystal Pure Iron</b>	1342
<i>Shintaro Yabe, Motoki Terano, Masahiko Yoshino</i>	
<b>Application of a Gradient Crystal Plasticity Model to Numerical Analysis of Metal Part of Nanoporous Metal – Polymer Composites</b>	1348
<i>Natalia Konchakova, Swantje Bargmann</i>	
<b>Plastic Micromechanical Response of 2D Cross Ply Magnesium Matrix Composites</b>	1354
<i>Jiming Zhou, Zhe Chen, Lehua Qi</i>	
<b>Construction of Statistically Similar Representative Volume Elements – Comparative Study Regarding Different Statistical Descriptors</b>	1360
<i>Lisa Scheunemann, Jörg Schröder, Daniel Balzani, Dominik Brands</i>	
<b>Microstructure based Description of Deformation Behavior of Dual Phase Steel Sheets</b>	1366
<i>Thipwipa Sirinakorn, Vitoon Uthaisangsuk, Sompong Srimanosaawapal</i>	
<b>Influence of Mesostructure for Deformation Characteristics and Formability in Dual Phase Steels</b>	1372
<i>Ryoji Kishi, Keiko Natori, Yoshihiko Arao, Tatsuya Tanaka</i>	
<b>Prediction of DP600 Flow Surfaces at Various Strain-rates Using Yld2004-18p Yield Function</b>	1378
<i>Amir Hassannejadash, Taamjeed Rahmaan, Daniel E. Green, Sergey F. Golovashchenko, Michael J. Worswick</i>	
<b>Uniaxial Tension Simulation Using Real Microstructure-based Representative Volume Elements Model of Dual Phase Steel Plate</b>	1384
<i>Sheng Huang, Chunfeng He, Yixi Zhao, Shuhui Li, Zhongqi Yu, Liang Dong</i>	
<b>Two-scale Modeling of DP Steel Incorporating Distributed Properties Inside Micro-constituents</b>	1390
<i>Jörg Schröder, Ashutosh Gandhi, Daniel Balzani</i>	
<b>Computer Simulation of Micro Rebound Hardness Test</b>	1396
<i>Seijiyo Maki, Takashi Yamamoto</i>	
<b>Measurement of Local Strain Path and Identification of Ductile Damage Limit based on Simple Tensile Test</b>	1402
<i>Ninshu Ma, Kenji Takada, Kentaro Sato</i>	
<b>Measurement of Local Plastic Deformation in Aluminum Alloy by Means of X-ray 3D Imaging Technique</b>	1408
<i>Masakazu Kobayashi, Yuuki Kawamura, Soutaro Ueno, Hiroyuki Toda, Hiromi Miura</i>	
<b>Measurement of Material Properties of Steel Sheets Using Laser Ultrasonic Technology</b>	1414
<i>Mitsuhiko Sano, Kazuhiko Ohara, Naoki Shimoda, Masashi Tsugeno</i>	
<b>Effects of Hydrogen on Softening Mechanism of Ti-45Al-5Nb-0.8Mo-0.3Y Alloy Deformed at High Temperatures</b>	1420
<i>Yingying Zong, Daosheng Wen, Wenchen Xu, Danmei Yang, Debin Shan, Zuyan Liu</i>	

## MICRO FORMING

<b>Large Area Micro-texture Imprinting onto Metallic Sheet via CNC Stamping .....</b>	1427
Tatstuhiko Aizawa, Masahiro Tamaki, Tatsuya Fukuda	
<b>Micrometer-scale Imprinting Process for Ceramic Sheet from Powder Compound Material .....</b>	1433
Fujio Tsumori, Yang Xu, Yuki Tanaka, Toshiko Osada, Hideshi Miura	
<b>Effect of Rubber Forming Process Parameters on Micro-patterning of Thin Metallic Plates .....</b>	1439
Chul Kyu Jin, Min Geun Jeong, Chung Gil Kang	
<b>Towards Mass Production by High Performance Transfer Press in Micro Bulk Forming .....</b>	1445
Rasoul Mahshid, Hans Nørgaard Hansen, Mogens Arentoft	
<b>Strain Rate Dependent Flow Stress Characterization Using Piezo-actuated Micropress .....</b>	1451
Muhammad Taureza, Sylvie Castagne, Tegoeh Tjahjowidodo, Peng Hu	
<b>Micro Deep Drawing of C1100 Conical-cylindrical Cups.....</b>	1457
Feng Gong, Qiang Chen, Zhi Yang, Dayu Shu, Shun Zhang	
<b>Formability of Micro Sheet Hydroforming of Ultra-fine Grained Stainless Steel .....</b>	1463
Hideki Sato, Ken-Ichi Manabe, Daiki Kondo, Dongbin Wei, Zhengyi Jiang	
<b>Templated Thermal Dewetting Process by Utilizing Nano Plastic Forming Technology .....</b>	1469
Takayuki Ueno, Motoki Terano, Masahiko Yoshino	
<b>Influence of Ultrasonic Vibration on Metal Foils Surface Finishing with Micro-forging .....</b>	1475
Yang Bai, Ming Yang	
<b>Experimental and Numerical Analysis of Springback Behavior Under Elevated Temperatures in Micro Bending Assisted by Resistance Heating .....</b>	1481
Qiu Zheng, Tatsuya Aoyama, Tetsuhide Shimizu, Ming Yang	
<b>Blank Shape Design for Sheet Metal Forming based on Geometrical Resemblance.....</b>	1487
Chen Yang, Peng Li, Lixia Fan	
<b>Effect of Microshot Peening on Fatigue Life of Spring Steel SUP9 .....</b>	1493
Yasunori Harada, Syusei Tanaka, Manabu Itoh, Masanori Nakatani	

## SEVERE PLASTIC DEFORMATION

<b>Influence of Combined Process “Rolling-pressing” on Microstructure and Mechanical Properties of Copper .....</b>	1499
Lezhnev Sergey, Naizabekov Abdrahman, Panin Evgeniy, Volokitina Irina	
<b>New Combined Process “Pressing-drawing” and Impact on Properties of Deformable Aluminum Wire .....</b>	1505
Lezhnev Sergey, Naizabekov Abdrahman, Volokitin Andrey, Volokitina Irina	
<b>Microstructure Evolution of Carbon Steel by Hot Equal Channel Angular Extrusion .....</b>	1511
Akira Yanagida, Ryo Aoki, Sho Ishikawa, Masataka Kobayashi	
<b>Improvement of Ductility at Room Temperature of Mg-3Al-1Zn Alloy Sheets Processed by Equal Channel Angular Pressing .....</b>	1517
Joungsik Suh, Jose Victoria-Hernandez, Dietmar Letzig, Ronland Golle, Sangbong Yi, Jan Bohlen, Wolfram Volk	
<b>Microstructures and Mechanical Properties of Ti-6Al-7Nb Processed by High-pressure Torsion .....</b>	1523
Maki Ashida, Peng Chen, Hisashi Doi, Yusuke Tsutsumi, Takao Hanawa, Zenji Horita	

## CASTING

<b>Characterization of Initial Structures, Texture and Precipitates in Strip-cast 3wt%Si Steel Sheet.....</b>	1529
Yang Wang, Yunbo Xu, Yuanxiang Zhang, Zuyi He, Songjian Fu, Yongmei Yu, Guodong Wang	
<b>Deformation Behavior of High-manganese TWIP Steels Produced by Twin-roll Strip Casting .....</b>	1535
Markus Daamen, Wiebke Nessen, Philipp T. Pinard, Silvia Richter, Alexander Schwedt, Gerhard Hirt	
<b>Sandwich Rolling of Twin-roll Cast Aluminium-steel Clad Strips .....</b>	1541
Mykhailo Stolbchenko, Olexandr Grydin, Florian Nürnberg, Andrii Samsonenko, Mirko Schaper	
<b>Effect of Casting Parameters on Roll Separation Force during Twin Roll Casting .....</b>	1547
Yun-Soo Lee, Hyoung-Wook Kim, Jae-Hyung Cho	
<b>Twin-Roll-Casting and Hot Rolling of Magnesium Alloy WE43 .....</b>	1553
Kristina Neh, Madlen Ullmann, Rudolf Kawalla	
<b>Metadynamic Recrystallization Kinetics of Twin Roll Cast AZ31 Alloy during Hot Deformation .....</b>	1559
Madlen Ullmann, Marcel Graf, Matthias Schmidtchen, Rudolf Kawalla	
<b>Modelling and Simulation of Die Casting Process for A356 Semi-solid Alloy .....</b>	1565
Jinlong Fu, Kaikun Wang	
<b>Refinement of Cast Cr-V-Mo Steel by Using Recrystallization and Partial Melting Method and Post Heat Treatments .....</b>	1571
Yi Meng, Sumio Sugiyama, Jun Yanagimoto	
<b>Tensile Properties of 2D-Cf/Mg Composite Fabricated by Liquid-solid Extrusion Following Vacuum Pressure Infiltration .....</b>	1577
Lehua Qi, Luyan Ju, Jiming Zhou	
<b>Development and Experimental Research of Aluminium Alloy Droplet Generator based on Mechanical Vibration .....</b>	1583
Songyi Zhong, Lehua Qi, Yong Tang, Jun Luo	

<b>Surface Roughness and Size Effect in Dendrite Arm Spacing at Preforms of AISI 304 (1.4301) Generated by Laser Rod End Melting.....</b>	1589
<i>Heiko Brüning, Marcel Teepe, Frank Vollertsen</i>	
<b>Dieless Forming of Carbon Fibre Reinforced Plastic Parts Using 3D Printer .....</b>	1595
<i>Ken-Ichiro Mori, Tomoyoshi Maeno, Yuki Nakagawa</i>	

## **FRP**

<b>Combination of Carbon Fibre Sheet Moulding Compound and Prepreg Compression Moulding in Aerospace Industry .....</b>	1601
<i>Jens Wulfsberg, Axel Herrmann, Gerhard Ziegmann, Georg Lonsdorfer, Nicole Stöß, Marc Fette</i>	
<b>Forming Sheets of Metal and Fibre-reinforced Plastics to Hybrid Parts in One Deep Drawing Process .....</b>	1608
<i>Bernd-Arno Behrens, Sven Hübler, André Neumann</i>	
<b>Fiber Deformation Behavior during Press Forming of Rectangle Cup by Using Plane Weave Carbon Fiber Reinforced Thermoplastic Sheet.....</b>	1614
<i>Shoji Hineno, Takeshi Yoneyama, Daichi Tatsuno, Masaki Kimura, Keisuke Shiozaki, Takashi Moriyasu, Masayuki Okamoto, Shigenori Nagashima</i>	
<b>Isothermal Forming of CFRTP Sheet by Penetration of Hemispherical Punch .....</b>	1620
<i>Sachihiro Isogawa, Hidenori Aoki, Masahiro Tejima</i>	
<b>Effect of Process Parameters on Epoxy Flow Behavior and Formability with CR340/CFRP Composites by Different Laminating in Deep Drawing Process .....</b>	1627
<i>Min-Sik Lee, Sung-Jin Kim, Ok-Dong Lim, Chung-Gil Kang</i>	
<b>Cold and Warm V-bending Test for Carbon-fiber-reinforced Plastic Sheet.....</b>	1633
<i>Yu Uriya, Katsuyoshi Ikeuchi, Jun Yanagimoto</i>	

## **PRESSES**

<b>Dimensional Synthesis for Multi-linkage of High-speed Mechanical Press.....</b>	1639
<i>Ye-Jian Li, Yu Sun, Shuan-Hu Wang</i>	
<b>Load Spectrum Testing and Analysis for Transmission System of Closed High-speed Press .....</b>	1645
<i>Hao Chen, Yu Sun, Kai Wu</i>	
<b>Dynamic Characteristics Analysis and Experimental Verification of High-speed Precision Punch Press based on Coupled Thermal-mechanical Model.....</b>	1651
<i>Fengfeng Hu, Yu Sun, Binbin Peng</i>	
<b>Thermo-mechanical Coupling Model and Dynamical Characteristics of Press Actuator .....</b>	1657
<i>Yu Chen, Yu Sun, Wuxue Ding</i>	
<b>Structural Optimization of Cylinder-crown Integrated Hydraulic Press with Hemispherical Hydraulic Cylinder .....</b>	1663
<i>Weiwei Zhang, Xiaosong Wang, Zongren Wang, Shijian Yuan</i>	
<b>Nonsimultaneous Press Forming Using 4-axes Direct Drive Digital Servo Press .....</b>	1669
<i>Kazuhiro Ichikawa, Chikara Murata, Tatsuya Takahashi</i>	

## **HOT STAMPING**

<b>Materials Modelling for Selective Heating and Press Hardening of Boron Steel Panels with Graded Microstructures .....</b>	1675
<i>Nan Li, Jianguo Lin, Trevor A. Dean, Damian Dry, D. Balint</i>	
<b>Experimental and Theoretical Studies on Formability of 22MnB5 at Elevated Temperatures by Gleble Simulator .....</b>	1682
<i>Rong Shean Lee, Yi Kai Lin, Ta Wei Chien</i>	

## **PART 3**

<b>A New Test Design for Assessing Formability of Materials in Hot Stamping .....</b>	1689
<i>Mohamed Mohamed, Jianguo Lin, Alistair Foster, Trevor Dean, John Dear</i>	
<b>Investigations on Austenitization Parameters Influencing Wear Behavior Within Hot Stamping .....</b>	1695
<i>Marion Merklein, Michael Wieland</i>	
<b>Auxiliary Current Hot Forming of High-strength Steel for Automobile Parts .....</b>	1701
<i>Guo-Feng Wang, Xue-Song Wu, Chao Sun, Shu-Fen Liu, Qi Liu, Hai-Shan Zhao</i>	
<b>Effect of Cooling Path on Phase Transformation of Boron Steel 22MnB5 .....</b>	1707
<i>Fangfang Li, Mingwang Fu, Jianping Lin</i>	
<b>Cracking Behavior of Al-Si Coating on Hot Stamping Boron Steel Sheet .....</b>	1713
<i>Kai Wang, Zhongxiang Gui, Peixing Liu, Yilin Wang, Yisheng Zhang</i>	
<b>Improvement of Cylindrical Deep Drawability in Hot Stamping .....</b>	1719
<i>Kazuhisa Kusumi, Naruhiko Nomura, Shuji Yamamoto, Masahiro Nakata, Masayuki Abe, Masahiro Suehiro</i>	
<b>Hot Stamping of High Strength Steel with Tailored Properties by Two Methods.....</b>	1725
<i>Zijian Wang, Peixing Liu, Ya Xu, Yilin Wang, Yisheng Zhang</i>	
<b>Hot Stamping Parts with Tailored Properties by Local Resistance Heating.....</b>	1731
<i>Weikang Liang, Liang Wang, Yong Liu, Yilin Wang, Yisheng Zhang</i>	

<b>Application of Hot Stamping Process by Integrating Quenching &amp; Partitioning Heat Treatment to Improve Mechanical Properties</b>	1737
<i>Xianhong Han, Yaoyao Zhong, Kun Yang, Zhenshan Cui, Jun Chen</i>	
<b>Damage Investigation of Boron Steel at Hot Stamping Conditions</b>	1744
<i>Nan Li, Chaoyang Sun, Ning Guo, Mohamed Momhammed, Jianguo Lin, M. Takeki</i>	
<b>Measurement of Heat Transfer Coefficient of Boron Steel in Hot Stamping</b>	1750
<i>Tzu-Hao Hung, Pei-Wu Tsai, Fuh-Kuo Chen, Tyng-Bin Huang, Wei-Liang Liu</i>	
<b>Hot Stamping of Load Adjusted Structural Parts</b>	1756
<i>Bernd-Arno Behrens, Anas Bouguecha, Christoph Michael Gaebel, Jörn Moritz, Jens Schröder</i>	
<b>Hot Semi-punching of Quenchable Steel Sheet</b>	1762
<i>Ken-Ichiro Mori, Tomoyoshi Maeno, Takuuya Suganami, Masato Sakagami</i>	
<b>Non-destructive Hardness Measurement of Hot-stamped High Strength Steel Sheets based on Magnetic Barkhausen Noise</b>	1768
<i>Xiaoyu Luo, Yilin Wang, Liang Wang, Jun Xie, Yisheng Zhang</i>	
<b>Investigation on Mechanical Properties Distribution on Hot Stamped Part</b>	1774
<i>Ming-Dong Huang, Bao-Yu Wang, Jing Zhou, Xue-Tao Li</i>	
<b>Hot Forming-quenching Integrated Process with Cold-hot Dies for 2A12 Aluminum Alloy Sheet</b>	1780
<i>Shi-Jian Yuan, Xiao-Bo Fan, Zhu-Bin He</i>	
<b>Hot Stamping of Door Impact Beam</b>	1786
<i>Ming-Fu Li, Tzu-Shin Chiang, Jyun-Hau Tseng, Chia-Nung Tsai</i>	
<b>Hot Stretch Bending and Creep Forming of Titanium Alloy Profile</b>	1792
<i>Tongsheng Deng, Dongsheng Li, Xiaoqiang Li, Pan Ding, Kai Zhao</i>	
<b>Effect of Pulse Current on Bending Behavior of Ti6Al4V Alloy</b>	1799
<i>Xifeng Li, Qiang Zhou, Shuangjun Zhao, Jun Chen</i>	

## PROCESS TRIBOLOGY

<b>Thermal Analysis of Bending Under Tension Test</b>	1805
<i>Ermanno Ceron, Paulo A. F. Martins, Niels Bay</i>	
<b>Draw Bending Method of Seizure for Pure Titanium Sheet</b>	1811
<i>Takayuki Muranaka, Hideyo Miyoshi, Takeshi Kihara, Masaaki Otsu, Osamu Haraguchi</i>	
<b>Effect of Tool Shape on Galling Behavior in Plate Shearing</b>	1817
<i>Tomohiro Yamada, Zhigang Wang, Tomonori Sasa</i>	
<b>Inverse Analysis Used to Determine Plastic Flow and Tribological Characteristics for Deep-drawing Sheet</b>	1823
<i>Adrian Pascu, Valentin Oleksik, Ioan Bondrea, Liviu Rosca</i>	
<b>A Prediction Method of Galling Position in Square Cup Drawing</b>	1830
<i>Zhigang Wang, Mingxu Yang, Yasuharu Yoshikawa</i>	
<b>Frictional Properties of AZ80 and ZE10 Magnesium Alloys Under Dry and Lubricated Contact Conditions</b>	1836
<i>Maziar Ramezani, Thomas Neitzert, Timotius Pasang, Miguel Angel Sellès</i>	
<b>Effects of Contact Pressure, Plastic Strain and Sliding Velocity on Sticking in Cold Forging of Aluminium Billet</b>	1842
<i>Laurent Dubar, Catalin I. Pruncu, André Dubois, Mirentxu Dubar</i>	
<b>Effects of Surface Finish and Die Temperature on Friction and Lubrication in Forging</b>	1848
<i>Hyunok Kim, Taylan Altan</i>	
<b>Identification of Friction Coefficient in High Aspect Ratio Combined Forward-backward Extrusion with Pulse Ram Motion on Servo Press</b>	1854
<i>Ryo Matsumoto, Kazunori Hayashi, Hiroshi Utsunomiya</i>	
<b>Prevention of Seizure in Inner Spline Backward Extrusion by Low-cycle Oscillation Using Servo Press</b>	1860
<i>Tomoyoshi Maeno, Ken-Ichiro Mori, Yuki Ichikawa, Minoru Sugawara</i>	
<b>Measurement of Friction Coefficient by Backward Extrusion with Rotating Tool Under Severe Forming Conditions</b>	1866
<i>Masatoshi Sawamura, Yasuhiro Yogo, Michiaki Kamiyama, Noritoshi Iwata</i>	
<b>Effect of Plastic Deformation of Bulk Material on Frictional Behavior in Dry Metal Forming</b>	1872
<i>Tatsuhiro Suzuki, Zhigang Wang, Yasuharu Yoshikawa</i>	
<b>Performance Evaluation of Lubricant for Producing Smooth Surface Product in Cold Extrusion of Aluminum Using Tool with Micro-groove Arrays</b>	1878
<i>Shunpei Kamitani, Kenji Nakanishi, Yong-Ming Guo</i>	
<b>Micro-texturing of DLC Thin Film Coatings and its Tribological Performance Under Dry Sliding Friction for Microforming Operation</b>	1884
<i>Tetsuhide Shimizu, Tai Kakegawa, Ming Yang</i>	
<b>Macro and Micro Structuring of Deep Drawing's Tools for Lubricant Free Forming</b>	1890
<i>Ali Mousavi, Michael Schomäcker, Alexander Brosius</i>	
<b>Improvement of Formability in Ironing of Stainless Steel Drawn Cups Using Low Friction Cermet Dies</b>	1896
<i>Yohei Abe, Tomohiro Fujita, Ken-Ichiro Mori, Kozo Osakada, Takashi Shiba, Witthaya Daodon</i>	
<b>Surface Morphology of Micro Stepped Components in Micro Cross Wedge Rolling</b>	1902
<i>Dongbin Wei, Haina Lu, Zhengyi Jiang, Ken-Ichi Manabe</i>	
<b>Tribological Characterization of Boron Nitride Films against Pure-titanium for Microforming die Application</b>	1909
<i>Yong Jin, Shigeo Yasuhara, Tetsuhide Shimizu, Ming Yang</i>	
<b>Friction Effects During Open-die Micro-forging/Extrusion Processes: An Upper Bound Approach</b>	1915
<i>Ehsan Ghassemali, Ming-Jen Tan, Chua Beng Wah, Samuel C. V. Lim, Anders E. W. Jarfors</i>	

<b>Analytical Prediction of Roughness after Ball Burnishing of Thermally Coated Surfaces</b>	1921
<i>Lars Hiegemann, Christian Weddeling, Noaman Ben Khalifa, A. Erman Tekkaya</i>	
<b>Estimation of Roles of Matrix and NbC Particles Dispersed in Surface Layer of Tool by PTA Welding</b>	1927
<i>Yoshifumi Higashigawa, Taishi Kohara, Masaki Morita, Masayoshi Akiyama</i>	
<b>Surface Improvement of Coining Dies with DLC Films</b>	1933
<i>Hideaki Mori, Yukikazu Shibata, Shyunji Araki, Tadahiko Imanara, Katsumi Sakamoto, Yoshinori Yama</i>	
<b>Surface Modification of Cold-working Die Steel by Electron Beam Irradiation – Formation of Cemented Carbide Composite Layer</b>	1939
<i>Takahiro Akao, Yuki Sakurai, Tetsuhiko Onda, Kazutake Uehara, Zhong-Chun Chen</i>	
<b>Surface Integrity of Tool Steels Multi-cut by Wire Electrical Discharge Machining</b>	1945
<i>Chuanliang Cao, Xianglin Zhang, Xiang Zha, Chunfa Dong</i>	
<b>Increasing of Service Times of Nitrided and CrN Coated Dies for Al Hot Extrusion</b>	1952
<i>Milan Tercelj, Peter Panjan, Peter Cvajc, Peter Fajfar, Goran Kugler</i>	
<b>Initiation of Sticking during Hot Rolling of Stainless Steel Plate</b>	1958
<i>André Dubois, Emilie Luc, Mirentxu Dubar, Laurent Dubar, Céline Thibaut, Jean-Michel Damasse</i>	
<b>Warm and Hot Upsetting Sliding Test: Tribology of Metal Processes at High Temperature</b>	1964
<i>André Dubois, Mirentxu Dubar, Laurent Dubar</i>	
<b>Estimation of Frictional Property of Lubricants for Hot Forging of Steel Using Low-speed Ring Compression Test</b>	1970
<i>Kazuhiko Asai, Kazuhiko Kitamura</i>	
<b>Sliding Characteristics in Hot Working Tool Steel at High Pressure</b>	1976
<i>Norio Takatsuji, Yoshiki Kakutani, Tetsuo Aida, Satoshi Murakami, Jin Shinmura, Hiroaki Matsui</i>	

## JOINING

<b>Steel-aluminum Knurled Interference Fits: Joining Process and Load Characteristics</b>	1982
<i>Stefan Kleditzsch, Birgit Awiszus, Michael Lätzter, Erhard Leidich</i>	
<b>Influence of Internal Hub Profile on Joining Process of Shaft-hub-connection by Lateral Extrusion</b>	1988
<i>Florian Dörr, Michael Funk, Mathias Liewald, Hansgeorg Binz, Robin Köslmeier</i>	
<b>Basic Property of High-precision Metal Flow Joining Method Without Need for any Specialized Punch</b>	1994
<i>Masatoshi Usui, Atsushi Shirayori, Michiharu Narasaki, Hiroya Murakami, Nobuyuki Kawame, Yukinori Suzuki, Masashi Watabe</i>	
<b>Temperature Influence on Bond Formation in Multi-material Joining by Forging</b>	2000
<i>Simon Wohletz, Peter Groche</i>	
<b>Cold Forge Spot-bonding of High Tensile Strength Steel and Aluminum Alloy Sheets</b>	2006
<i>Yuri Miwada, Takahiro Ishiguro, Eiji Abe, Nobuki Yukawa, Takashi Ishikawa, Tomoaki Saganuma</i>	
<b>Wire Joining by Rotary Swaging</b>	2012
<i>Eric Mouni, Philipp Wilhelm, Bernd Kuhfuss, Christian Schenck, Kirsten Tracht</i>	
<b>Experimental and Numerical Analysis of Electrical Contact Crimping to Predict Mechanical Strength</b>	2018
<i>Katia Mocellin, Matthieu Petitprez</i>	
<b>An Analytical Model on Spin-bonding of Composite Tube</b>	2024
<i>Zhipeng Zhang, Wencheng Xu, Debin Shan</i>	
<b>Analysis of Elastic-plastic Interference-fit Joints</b>	2030
<i>Hava Hiyük, Omer Music, Asuman Koç, Celalettin Karadogan, Çagdas Bayram</i>	
<b>Mechanical Property of Al Alloy Joints by Friction Stir Blind Riveting</b>	2036
<i>Junying Min, Jingjing Li, Blair E. Carlson, Yongqiang Li, Jianping Lin</i>	
<b>Self-piercing Riveting with Inner Flange Pipe Rivet</b>	2042
<i>Zhichao Huang, Shuguang Xue, Jiamei Lai, Lingjun Xia, Jinqing Zhan</i>	
<b>Joining Process for Plates Using Plastic Deformation with Rotating Tool and Pilot Hole</b>	2048
<i>Noboru Nakayama, Takayoshi Ikeda, Naoki Kobayashi, Masaomi Horita</i>	
<b>Improvement of Joinability in Mechanical Clinching of Ultra-high Strength Steel Sheets Using Counter Pressure with Ring Rubber</b>	2056
<i>Yohei Abe, Shoma Nishino, Ken-Ichiro Mori, Takato Saito</i>	
<b>Effect of Tool Eccentricity on the Joint Strength in Mechanical Clinching Process</b>	2062
<i>Chan Chin Wang, Heng Keong Kam, Wen Chiet Cheong</i>	
<b>Press Forming Process of Closed-profile Automotive Parts Without Flange</b>	2068
<i>Yuji Yamasaki, Kazuhiko Higai, Toyohisa Shinmiya</i>	
<b>Hemming for Joining High Strength Steel Sheets</b>	2074
<i>Zamzuri Hamedon, Ken-Ichiro Mori, Yohei Abe</i>	
<b>Evolution of Microstructure and Mechanical Properties During Friction Stir Welding of A5083 and A6082</b>	2080
<i>Jae-Hyung Cho, Won Jae Kim, Chang Gil Lee</i>	
<b>Influence of Joint Geometry on Micro and Macro Mechanical Properties of Friction Stir Spot Welded Joints</b>	2086
<i>Gianluca Buffa, Pierluigi Fanelli, Livan Fratini, Francesco Vivio</i>	
<b>Influence of Tool Shape on Friction Stir Welded Joint of Aluminum and Steel with Circular Weld Line</b>	2092
<i>Toshiaki Yasui, Hiroki Mizushima, Masami Tsubaki, Tomoyuki Fujita, Masahiro Fukumoto</i>	
<b>Characterization of Mechanical Properties in Processed Friction Stir Welded High-strength Aluminum Alloy Blanks</b>	2098
<i>Tobias Gnibl, Marion Merklein</i>	
<b>Joining Technologies for Future Automobile Multi-material Modules</b>	2104
<i>Yvan Chastel, Lucas Passemard</i>	

<b>Joining of Various Kinds of Metal Plates Using Ultrasonic Vibrations .....</b>	2111
<i>Genki Nanaumi, Daisuke Mizushima, Naoto Otake</i>	
<b>Thermal-mechanical Analysis of Ultrasonic Spot Welding Considering Acoustic Softening Effect .....</b>	2117
<i>Kunkun Chen, Yansong Zhang</i>	
<b>Adhesive-embossing Hybrid Joining Process to Fiber-reinforced Thermosetting Plastic and Metallic Thin Sheets .....</b>	2123
<i>Zhequn Huang, Sumio Sugiyama, Jun Yanagimoto</i>	
<b>Vaporizing Foil Actuator: A Versatile Tool for High Energy-rate Metal Working .....</b>	2129
<i>Anupam Vivek, Glenn S. Daehn</i>	
<b>Electromagnetic Linked Micro Part Processing .....</b>	2135
<i>Bernd Kuhfuss, Christian Schenck, Philipp Wilhelm, Lasse Langstädtler</i>	
<b>Numerical and Experimental Analysis of Resistance Projection Welding of Square Nuts to Sheets .....</b>	2141
<i>Chris V. Nielsen, Wengi Zhang, Paulo A. F. Martins, Niels Bay</i>	
<b>Influence of Diffusion Mechanisms in Aluminium Solid-state Welding Processes .....</b>	2147
<i>Daniel R. Cooper, Julian M. Allwood</i>	
<b>Deformation Properties and Bending/Diffusion Bonding Processing of a P/M Ti-22Al-25Nb Alloy at Elevated Temperature.....</b>	2153
<i>Kaifeng Zhang, Yuanxin Wang, Jianbo Jia, Baoyong Li</i>	
<b>Nanoporous Nickel Fabricated by Dealloying of Rolled Ni-Mn Sheet .....</b>	2159
<i>Masataka Hakamada, Mamoru Mabuchi</i>	

## ADVANCED TUBE FORMING

<b>Thermal Influences during Rotary Draw Bending of Tubes from Stainless Steel.....</b>	2165
<i>Rainer Steinheimer, Bernd Engel</i>	
<b>Modelling of Wrinkling in NC Bending of Thin-walled Tubes with Large Diameters under Multi-die Constraints Using Hybrid Method .....</b>	2171
<i>Nan Liu, He Yang, Heng Li, M. Zhan, Zhijun Tao, Xiao Hu</i>	
<b>Twist Springback of Asymmetric Thin-walled Tube in Mandrel Rotary Draw Bending Process.....</b>	2177
<i>Xin Xue, Juan Liao, Gabriela Vincze, Jose Gracio</i>	
<b>Stretch Press Bending of AZ31 Magnesium Alloy Extruded Square Tube .....</b>	2184
<i>Osamu Hasegawa, Ken-Ichi Manabe, Tsutomu Murai</i>	
<b>Tube Shear Hydro-bending of Titanium Alloys.....</b>	2190
<i>Cong Han, Yong Wang, Yongchao Xu, Shijian Yuan</i>	
<b>Strength and Formability Designs of Tube-hydroformed Automotive front Sub-frame .....</b>	2198
<i>Sin-Liang Lin, Bo-Hao Huang, Fuh-Kuo Chen</i>	
<b>Application of Pulsating Hydroforming in Manufacture of Engine Cradle of Austenitic Stainless Steel.....</b>	2205
<i>Yong Xu, Shihong Zhang, Ming Cheng, Hongwu Song, Xiaosong Zhang</i>	
<b>Bursting Prediction of Hydroforming Aluminium Alloy Tube based on Gurson-Tvergaard-Needleman Damage Model .....</b>	2211
<i>Buang Teng, Weinian Wang, Yinquan Liu, Shijian Yuan</i>	
<b>Large-expansion Hydroforming Technology Achieving Three-times Expanding .....</b>	2217
<i>Manabu Wada, Masaaki Mizumura, Keinosuke Iguchi, Hiromitsu Kaneda</i>	
<b>Analytical and Numerical Modeling of Thick Tube Hydroforging .....</b>	2223
<i>Bandar Alzahrani, Gracious Ngaiie</i>	
<b>Process Parameter with High Expansion Rate of SUS304 Tube Hydroforming .....</b>	2230
<i>Yi-Chun Chen, Chih-Yu Chuang, Ming-Fu Lee</i>	
<b>Improvement of Die Filling by Prevention of Temperature Drop in Gas Forming of Aluminium Alloy Tube Using Air Filled into Sealed Tube and Resistance Heating .....</b>	2237
<i>Tomoyoshi Maeno, Ken-Ichiro Mori, Chihiro Unou</i>	
<b>Formability Determination of Titanium Alloy Tube for High Pressure Pneumatic Forming at Elevated Temperature.....</b>	2243
<i>Gang Liu, Yong Wu, Jie Zhao, Kai Wang, Shijian Yuan</i>	
<b>Hot Extrusion of Hollow Helical Tubes of Magnesium Alloys .....</b>	2249
<i>Yeong-Maw Hwang, Cheng-Nan Chang</i>	
<b>Multi-objective Optimization of Medium Frequency Induction Heating Process for Large Diameter Pipe Bending .....</b>	2255
<i>Wang Xin, Zhou Jie, Liang Qiang</i>	
<b>Assessment of Anisotropy of Extruded Tubes by Ring Hoop Tension Test .....</b>	2261
<i>Christopher P. Dick, Yannis P. Korkolis</i>	
<b>Development of Three-dimensional Hot Bending and Direct Quench Technology .....</b>	2267
<i>Naoaki Shimada, Atsushi Tomizawa, Hiroaki Kubota, Hiroshi Mori, Mitsusato Hara, Shinjiro Kuwayama</i>	
<b>Coupled Thermo-mechanical FE Simulation of Unloading Cooling Springback in NC Heating Bending of Large Diameter Thin-walled Commercial Pure Titanium Tube .....</b>	2273
<i>Tao Zhijun, Yang He, Li Heng, Zhang Zhiyong, Chen Zemiao</i>	

## INCREMENTAL FORMING

<b>Influence of Geometrical Parameters, Wall Angle and Part Shape on Thickness Reduction of Single Point Incremental Forming .....</b>	2280
<i>Valentin Oleksik</i>	

<b>Tool Dynamics During Single Point Incremental Forming Process .....</b>	2286
<i>Oscar Martínez-Romero, María Luisa García-Romeu, Daniel Olvera-Trejo, Isabel Bagudanch, Alex Elías-Zúñiga</i>	
<b>Identifying Polymeric Constitutive Equations for Incremental Sheet Forming Modelling .....</b>	2292
<i>Isabel Bagudanch, Oscar Martínez-Romero, Alex Elías-Zúñiga, María Luisa García-Romeu</i>	
<b>Complex Incremental Sheet Forming Using back Die Support on Aluminium 2024, 5083 and 7075 Alloys .....</b>	2298
<i>Nagarajan Devarajan, Giribaskar Sivaswamy, Rahul Bhattacharya, David P. Heck, Muhammad Amir Siddiq</i>	
<b>A New Process Design for Performing Hole-flanging Operations by Incremental Sheet Forming .....</b>	2305
<i>Markus Bambach, Holger Voswinckel, Gerhard Hirt</i>	
<b>New Processing Technologies of Incremental Sheet Metal Forming .....</b>	2311
<i>Sebastian Härtel, Birgit Awiszus</i>	
<b>Friction Stir Incremental Forming of A2017 Aluminum Sheets .....</b>	2318
<i>Masaaki Otsu, Mitsuteru Yasunaga, Mitsuhiro Matsuda, Kazuki Takashima</i>	
<b>A Comparative Study on Process Potentials for Frictional Stir- and Electric Hot-assisted Incremental Sheet Forming .....</b>	2324
<i>Dongkai Xu, Bin Lu, Tingting Cao, Jun Chen, Hui Long, Jian Cao</i>	
<b>Incremental Forming with Local Heating by Laser Irradiation for Magnesium Alloy Sheet .....</b>	2330
<i>Ryutaro Hino, Keita Kawabata, Fusahito Yoshida</i>	
<b>Rotary Swaging Forming Process of Tube Workpieces .....</b>	2336
<i>Qi Zhang, Kaiqiang Jin, Dong Mu, Pengju Ma, Jie Tian</i>	
<b>2D-simulation of Material Flow During Infeed Rotatory Swaging Using Finite Element Method .....</b>	2342
<i>Eric Mouni, Svetlana Ishkina, Bernd Kuhfuss, Thomas Hochrainer, Adrian Struss, Martin Hunkel</i>	
<b>Influence of Eccentricity on Movements of Orbital Head with Double Eccentric Structure in Orbital Forging .....</b>	2348
<i>Wencheng Feng, Wangui Yao, Peng Jiang</i>	
<b>Microstructure and Texture Evolutions in AISI 1050 Steel by Flow Forming .....</b>	2355
<i>Vikram Bedekar, Praveen Pauskar, Rajiv Shrivpuri, J. Howe</i>	
<b>Successive Forging of Long Plate Having Inclined Cross-section .....</b>	2361
<i>Liyana Tajul, Tomoyoshi Maeno, Ken-Ichiro Mori</i>	
<b>Micro Parts Processing Using Laser Cutting and Ultra-short-pulse Laser Peen Forming .....</b>	2367
<i>Yoshihiro Sagisaka, Kiyomitsu Yamashita, Wataru Yanagihara, Hiroyasu Ueta</i>	
<b>Effect of Pass-set Shape on Formability in Synchronous Multipass Spinning .....</b>	2373
<i>Yoshihiko Sugita, Hirohiko Arai</i>	
<b>Friction-spinning – Interesting Approach to Manufacture of Complex Sheet Metal Parts and Tubes .....</b>	2379
<i>Benjamin Lossen, Werner Homberg</i>	
<b>Laser-assisted Metal Spinning of Challenging Materials .....</b>	2385
<i>Fritz Klocke, Christoph Martin Brummer</i>	
<b>Wrinkling Failure Mechanics in Metal Spinning .....</b>	2391
<i>Michael Watson, Hui Long</i>	
<b>Metal Flow Model of Cylindrical Parts by Counter-roller Spinning .....</b>	2397
<i>Gangfeng Xiao, Qinxiang Xia, Xiuquan Cheng, Yujing Zhou</i>	

## FEM

<b>FEM/BEM Simulation of Cold Forging Process Considering Press-tool-workpiece Interaction .....</b>	2403
<i>Fabian Schongen, Fritz Klocke, Patrick Matfeld, Sergej Rjasanow, Richards Grzhibovskis</i>	
<b>Optimisation of Size-controllable Centroidal Voronoi Tessellation for FEM Simulation of Micro Forming Processes .....</b>	2409
<i>Liang Luo, Zhengyi Jiang, Haina Lu, Dongbin Wei, Kezhi Linghu, Xianming Zhao, Di Wu</i>	
<b>Effect of Forming Speed in Precision Forging Process Evaluated Using CAE Technology and High Performance Servo-press Machine .....</b>	2415
<i>Soo-Young Kim, Kaoru Tsuruoka, Tadashi Yamamoto</i>	
<b>Electro-thermo-mechanical Finite Element Analysis on DC Pulse Resistance Pressure Sintering Process of Zirconia Part .....</b>	2421
<i>Yoshihiro Kubota, Kunio Hayakawa, Takumi Okano, Shigekazu Tanaka, Tamotsu Nakamura</i>	
<b>Finite Element Simulation of Multi Material Metal Forming .....</b>	2427
<i>Jean-Loup Chenot, Christine Béraudo, Marc Bernacki, Lionel Fournier</i>	
<b>Effects of Anisotropic Yield Functions on the Accuracy of Forming Simulations of Hole Expansion .....</b>	2433
<i>Eiji Iizuka, Kazuma Hashimoto, Toshihiko Kuwabara</i>	
<b>Modeling Mechanical Properties of 21-Cr Ferritic Stainless Steel with Variation of Stress Ratio .....</b>	2439
<i>Hanyong Jung, Yangjin Chung, Myoung-Gyu Lee, Kichul Park, Jaebok Nam</i>	
<b>Finite Element Simulation of Multi-gripper Flexible Stretch Forming .....</b>	2445
<i>You Wang, Mingzhe Li, Hongwei Liu, Jian Xing</i>	
<b>Comparison of Analytical Models for Sheet Rolling .....</b>	2451
<i>Christopher J. Cawthorn, Evripides G. Loukaides, Julian M. Allwood</i>	
<b>Multi-objective Optimization of Die Geometry in Ingot Forging .....</b>	2457
<i>Peter Christiansen, Paulo A. F. Martins, Niels Bay, Jesper Henri Hattel</i>	
<b>Finite Element Method Analysis of Micro Cross Wedge Rolling of Metals .....</b>	2463
<i>Zhengyi Jiang, Haina Lu, Dongbin Wei, K. Z. Linghu, Xianming Zhao, Xiaoming Zhang, Di Wu</i>	
<b>Finite Element Modeling of Shear Strain in Asymmetric and Symmetric Rolling in Multi Roll Calibers .....</b>	2469
<i>Alexander Pesin, Mikhail Chukin, Aleksey Korchunov, Denis Pustovoytov</i>	

<b>Finite Element Analysis Model of Rotary Forging for Assembling Wheel Hub Bearing Assembly .....</b>	2475
<i>Chan-Hee Nam, Min-Cheol Lee, Jae-Geun Eom, Moo-Ho Choi, Man-Soo Joun</i>	
<b>Processing Optimization for Large Spherical Valve Body based on FE Simulation .....</b>	2481
<i>Dongsheng Qian, Huajie Mao, Jiadong Deng, Jinshan Yue</i>	
<b>Three-dimensional Finite Element Analysis for Flying Shearing of X100 Hot-rolled Steel Plate.....</b>	2488
<i>Ling-Yun Qian, Gang Fang, Pan Zeng</i>	
<b>Finite Element Analysis of Deep Piercing Process.....</b>	2494
<i>Mansoo Joun, Mincheol Kim, Jongho Kim, Wanjin Chung</i>	

## **CONTROL OF METAL FORMING**

<b>Support Roller Control and Springback Compensation in Flexible Spinning.....</b>	2499
<i>James A. Polyblank, Julian M. Allwood</i>	
<b>Radial-axial Force Controlled Electromagnetic Sheet Deep Drawing: Electromagnetic Analysis .....</b>	2505
<i>Zhipeng Lai, Quanliang Cao, Xiaotao Han, Zhongyu Zhou, Qi Xiong, Xiao Zhang, Qi Chen, Liang Li</i>	
<b>Shear Surface Control in Blanking by Adaptronic Systems.....</b>	2512
<i>Andrea Ghiotti, Stefania Bruschi, Paolo Regazzo</i>	
<b>Development of In-process Fuzzy Control System for T-shape Tube Hydroforming .....</b>	2518
<i>Ken-Ichi Manabe, Xu Chen, Dai Kobayashi, Kazuo Tada</i>	
<b>Forging Process Control: Influence of Key Parameters Variation on Product Specifications Deviations.....</b>	2524
<i>Zakaria Allam, Eric Becker, Cyrille Baudouin, Régis Bigot, Pierre Krumpipe</i>	
<b>Development and Thermo-physical Characterization of Polymers/Metallic Powder Mixtures for MIM Application .....</b>	2530
<i>Paul Tourneroche, Jean-Claude Gelin, Mohamed. Sahli, Thierry Barrière</i>	
<b>Author Index</b>	