

17th International Conference on Sheet Metal (SHEMET17)

Procedia Engineering Volume 183

Palermo, Italy
10 - 12 April 2017

Editors:

Livan Fratini

ISBN: 978-1-5108-3995-3

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. (2017)

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: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PREFACE	1
<i>N/A</i>	
DESIGN OF PROCESS PARAMETERS IN WIPING Z-BENDING PROCESS USING STATISTICAL ANALYSIS TECHNIQUE	5
<i>Sutasn Thipprakmas, Pakkawat Komolruji</i>	
DEVELOPMENT OF THE BUS FRAME BY FLEXIBLE ROLL FORMING	11
<i>Dongun Kim, Myunghwan Cha, Yeon Sik Kang</i>	
FE-ANALYSIS OF CHANNEL WIDTH EFFECTS ON SPRING-BACK CHARACTERISTICS IN THE U-BENDING PROCESS	17
<i>Wiriyakorn Phanitwong, Sutasn Thipprakmas</i>	
INFLUENCE OF WARM BENDING ON THE SURFACE TOPOGRAPHY OF TITANIUM ALLOY TI-6AL-4V	23
<i>Dubjella Patrick, Merklein Marion</i>	
LOCAL HEAT TREATMENT IN DRAW BENDING FOR PROFILES OF MANGANESE BORON STEEL 22MNB5	31
<i>Behrens Bernd-Arno, Bonk Christian, Hübner Sven, Uhe Johanna, Klie Roman, Moritz Jörn</i>	
CONSIDERATIONS ON ASSIST GAS JET OPTIMIZATION IN LASER CUTTING WITH DIRECT DIODE LASER	37
<i>Gonçalo C. Rodrigues, Cédric Decroos, Joost R. Duflou</i>	
INCREASE OF LIFETIME FOR FINE BLANKING TOOLS	45
<i>Guy Claus, Martin Weber, Demmler Matthias</i>	
NOTCH SHEAR CUTTING OF ALUMINUM ALLOYS	53
<i>Michael Krinninger, Martin Feistle, Roland Golle, Wolfram Volk</i>	
DETECTION OF THE ONSET OF GALLING IN STRIP REDUCTION TESTING USING ACOUSTIC EMISSION	59
<i>M. Moghadam, P. Christiansen, N. Bay</i>	
INVESTIGATION OF WRINKLING IN HYDRODYNAMIC DEEP DRAWING ASSISTED BY RADIAL PRESSURE WITH INWARD FLOWING LIQUID	65
<i>Mazjar Khademi, Abdolhamid Gorji, Mohammad Bakhshi, Milad Sadegh Yazdi</i>	
INVESTIGATIONS ON DELAMINATION BEHAVIOR OF SANDWICH SHEETS	71
<i>Mathias Liewald, Dennis Hofmann</i>	
MATERIAL CHARACTERIZATION AND VALIDATION STUDIES FOR MODELING DUCTILE DAMAGE DURING DEEP DRAWING	77
<i>Doig Maria, Isik Kerim, Clausmeyer Till, Heibel Sebastian, Richter Helmut, Tekkaya A. Erman</i>	
METALLOGRAPHIC ANALYSIS OF NAKAJIMA TESTS FOR THE EVALUATION OF THE FAILURE DEVELOPMENTS	83
<i>Affronti Emanuela, Merklein Marion</i>	
DETECTION OF STRAIN LOCALIZATION IN NAKAZIMA FORMABILITY TEST - EXPERIMENTAL RESEARCH AND NUMERICAL SIMULATION	89
<i>Dmytro Lumelskyj, Jerzy Rojek, Dorel Banabic, Lucian Lazarescu</i>	
EXPERIMENTAL AND NUMERICAL STUDIES ON THE FORMING BEHAVIOR OF HIGH STRAIN AL-MG-SI(-CU) SHEET ALLOYS	95
<i>Artur Klos, Alexander Kahrmanidis, Daniel Wortberg, Marion Merklein</i>	
FORMABILITY EVALUATION OF 3D CLOSED SECTION PARTS FROM SHEET METAL BASED ON GEOMETRICAL INFORMATION	101
<i>Akihiro Tokugawa, Masahiko Sato, Yukihisa Kuriyama, Katsuyuki Suzuki</i>	
FORMING-INDUCED GLOSS REDUCTION OF COIL COATED SHEETS FOR WHITE GOODS	107
<i>Bernd-Arno Behrens, Sven Hübner, Christoph Michael Gaebel</i>	
NUMERICAL PREDICTION OF THE FORMING LIMIT DIAGRAMS OF THIN SHEET METAL USING SPIF TESTS	113
<i>Ben Hmida Ramzi, Thibaud Sebastien, Richard Fabrice, Hapsari Gemala, Malécot Pierrick</i>	
THEORETICAL FLD PREDICTION BASED ON M-K MODEL USING GURSON'S PLASTIC POTENTIAL FUNCTION FOR STEEL SHEETS	119
<i>Mir Emad Hosseini, Seyed Jamal Hosseinipour, Mohammad Bakhshi-Jooybari</i>	
A PROCEDURE FOR DUCTILE DAMAGE PARAMETERS IDENTIFICATION BY MICRO INCREMENTAL SHEET FORMING	125
<i>Gemala Hapsari, Ramzi Ben Hmida, Fabrice Richard, Sébastien Thibaud, Pierrick Malécot</i>	

FRICION STIR INCREMENTAL FORMING OF PREFORMED SHEETS WITH IMPROVING BENDING STIFFNESS	131
<i>Masaaki Otsu, Tomoro Uchimura, Masato Okada, Hidenori Yoshimura, Ryo Matsumoto, Takayuki Muranaka</i>	
INCREMENTAL FORMING OF TUNNEL TYPE PARTS	137
<i>Daniel Afonso, Ricardo Alves De Sousa, Ricardo Torcato</i>	
INCREMENTAL FORMING WITH LOCAL INDUCTION HEATING ON MATERIALS WITH MAGNETIC AND NON-MAGNETIC PROPERTIES	143
<i>Gagliardi Francesco, Ambrogio Giuseppina, Filice Luigino</i>	
INFLUENCE OF GLOBAL FORCED-AIR WARMING ON THE BULGE FORMATION IN SHALLOW SLOPED SPIF PARTS	149
<i>Amirahmad Mohammadi, Hans Vanhove, Dieter Weise, Albert Van Bael, Dirk Landgrebe, Joost R. Dufloy</i>	
NON-RIGID REGISTRATION: A POWERFUL MORPHING TOOL IN SPIF PROCESS PLANNING	155
<i>Carette Yannick, Vancleef Sanne, Vanhove Hans, Vander Sloten Jos, Dufloy Joost</i>	
OBSERVATIONS ON HEAT GENERATED IN SINGLE POINT INCREMENTAL FORMING	161
<i>P. Gupta, J. Jeswiet</i>	
PERFORMANCES ANALYSIS OF TITANIUM PROSTHESES MANUFACTURED BY SUPERPLASTIC FORMING AND INCREMENTAL FORMING	168
<i>Giuseppina Ambrogio, Emanuele Sgambitterra, Luigi De Napoli, Francesco Gagliardi, Gionata Fragomeni, Antonio Piccinini, Pasquale Guglielmi, Gianfranco Palumbo, Donato Sorgente, Luigi La Barbera, Tomaso M. Villa</i>	
PRODUCTION OF THIN SHELL CLAVICLE IMPLANTS THROUGH SINGLE POINT INCREMENTAL FORMING	174
<i>Hans Vanhove, Yannick Carette, Sanne Vancleef, Joost R. Dufloy</i>	
RECENT APPROACHES FOR THE MANUFACTURING OF POLYMERIC CRANIAL PROSTHESES BY INCREMENTAL SHEET FORMING	180
<i>G. Centeno, I. Bagudanch, D. Morales-Palma, M. L. García-Romeu, B. Gonzalez-Perez-Somarrriba, A. J. Martinez-Donaire, L. M. Gonzalez-Perez, C. Vallengano</i>	
REVEALING THE DOMINANT FORMING MECHANISM OF SINGLE POINT INCREMENTAL FORMING (SPIF) BY SPLITTING PLASTIC ENERGY DISSIPATION	188
<i>Fawad Maqbool, Markus Bambach</i>	
USE OF SHEET MATERIAL FOR RAPID PROTOTYPING OF CARDIOVASCULAR STENTS	194
<i>Guendalina Catalano, Ali Gökhan Demir, Valentina Furlan, Barbara Previtali</i>	
ADVANCES IN MECHANICAL CLINCHING: EMPLOYMENT OF A ROTATING TOOL	200
<i>F. Lambiase, A. Paoletti, A. Di Ilio</i>	
ANALYSIS OF ELECTRICAL ENERGY DEMANDS IN FRICTION STIR WELDING OF ALUMINUM ALLOYS	206
<i>Gianluca Buffa, Davide Campanella, Rosa Di Lorenzo, Livan Fratini, Giuseppe Ingarao</i>	
DESIGN OF STAMPING PROCESSES OF PINLESS FSWE THIN SHEETS IN AA1050 ALLOY FOR MOTOMOTIVE APPLICATIONS USING FEM	213
<i>Mohamad El Mehtedi, Archimede Forcellese, Lorenzo Panaccio, Michela Simoncini</i>	
DISK-LASER WELDING OF TI-6AL-4V TITANIUM ALLOY PLATES IN T-JOINT CONFIGURATION	219
<i>F. Caiazzo, F. Cardaropoli, V. Alfieri, V. Sergi, P. Argenio, G. Barbieri</i>	
FORMING AND JOINING OF CARBON-FIBER-REINFORCED THERMOPLASTICS AND SHEET METAL IN ONE STEP	227
<i>Behrens Bernd-Arno, Hübner Sven, Grbic Nenad, Micke-Camuz Moritz, Wehrhane Tim, Neumann André</i>	
IMAGE ENHANCEMENT ALGORITHM FOR OPTICAL MICROSTRUCTURAL CHARACTERIZATION OF SHAPE MEMORY TINI FRICTION STIR PROCESSED	233
<i>Barcelona Antonio, Palmeri Dina, Campanella Davide</i>	
MAGNESIUM AND ALUMINIUM ALLOYS DISSIMILAR JOINING BY FRICTION STIR WELDING	239
<i>V. Paradiso, F. Rubino, P. Carlone, G. S. Palazzo</i>	
MECHANICAL PROPERTIES AND FORMABILITY OF COLD ROLLED FRICTION STIR WELDED SHEETS IN AA5754 FOR AUTOMOTIVE APPLICATIONS	245
<i>Filippo Gabrielli, Archimede Forcellese, Mohamad El Mehtedi, Michela Simoncini</i>	
METROLOGY AND MICROSCOPY ANALYSIS OF MULTISHEET PACKS MANUFACTURED VIA SUPERPLASTIC FORMING TO STUDY POSSIBLE DIFFUSION BONDING	251
<i>Mohammad Reza Allazadeh, Nicola Zuelli</i>	
NUGGET DIAMETER IN RESISTANCE SPOT WELDING: A COMPARISON BETWEEN A DYNAMIC RESISTANCE BASED APPROACH AND ULTRASOUND C-SCAN	257
<i>Cameron Summerville, David Adams, Paul Compston, Matthew Doolan</i>	

ON THE MICROSTRUCTURAL ANALYSIS OF LFW JOINTS OF Ti6Al4V COMPONENTS MADE VIA ELECTRON BEAM MELTING.....	264
<i>Fabio Scherillo, Mariacira Liberini, Antonello Astarita, Stefania Franchitti, Carmine Pirozzi, Rosario Borrelli, Pierluigi Cirillo, Antonio Caraviello, Antonino Squillace, Luigi Carrino</i>	
THE EFFECTS OF PROCESS PARAMETERS ON MECHANICAL PROPERTIES AND CORROSION BEHAVIOR IN FRICTION STIR WELDING OF ALUMINUM ALLOYS	270
<i>G. D'Urso, C. Giardini, S. Lorenzi, M. Cabrini, T. Pastore</i>	
AN INDUSTRIAL APPLICATION OF THE CONTINUUM DAMAGE MECHANICS (CDM) MODEL FOR PREDICTING FAILURE OF AA6082 UNDER HFQ® PROCESS.....	277
<i>Mohamed Mohamed, Damian Szegda</i>	
EXPERIMENTAL INVESTIGATION AND NUMERICAL MODELING OF THE BOND SHEAR STRENGTH OF MULTI-LAYERED 6000 SERIES ALUMINUM ALLOYS	283
<i>Jürgen Herrmann, Sebastian Suttner, Marion Merklein</i>	
META-HEURISTIC ALGORITHMS FOR NESTING PROBLEM OF RECTANGULAR PIECES	291
<i>Ernesto Lo Valvo</i>	
NUMERICAL APPROACH FOR THE MODELLING OF A SHEET METAL FOLDING PROCESS.....	297
<i>Matthias Schneider, Mathias Liewald</i>	
PROCESS SIMULATION MODEL OF A FLEXIBLE CLAMPING TECHNOLOGY FOR SHEET METAL PARTS	303
<i>Felix Bauer, Alexandra Werber, Tobias Seiberlich, Marion Merklein</i>	
AN EXPLORATORY STUDY FOR ANALYZING THE ENERGY SAVINGS OBTAINABLE BY RESHAPING PROCESSES OF SHEET METAL BASED COMPONENTS.....	309
<i>Giuseppe Ingarao, Rosa Di Lorenzo, Livan Fratini</i>	
EFFECTS OF PHASE TRANSFORMATION IN HOT STAMPING OF 22MnB5 HIGH STRENGTH STEEL	316
<i>Giulia Venturato, Michele Novella, Stefania Bruschi, Andrea Ghiotti, Rajiv Shivpuri</i>	
EVALUATION OF EFFECTIVE PARAMETERS ON STAMPING OF METALLIC BIPOLAR PLATES	322
<i>Farzad Ahmadi Khatir, Majid Elyasi, Hossein Talebi Ghadikolaee, Morteza Hosseinzadeh</i>	
FORMING TECHNOLOGY FOR 3D CLOSED SECTION PARTS FROM SHEET METAL.....	330
<i>Masahiko Sato, Tohru Yoshida, Yukihisa Kuriyama, Katsuyuki Suzuki, Akihiro Tokugawa</i>	
SUPPORTING LIGHTWEIGHT DESIGN: VIRTUAL MODELING OF HOT STAMPING WITH TAILORED PROPERTIES AND WARM AND HOT FORMED ALUMINIUM	336
<i>Mark Vrolijk, David Lorenz, Harald Porzner, Martin Holecek</i>	
THE USE OF FUSED DEPOSITION MODELLED TOOLING IN LOW VOLUME PRODUCTION OF STRETCH FORMED DOUBLE CURVATURE COMPONENTS.....	343
<i>Alan Leacock, Gregor Volk, David McCracken, Desmond Brown</i>	
WARM FORMING OF AN AA5754 COMPONENT FOR RAILWAY VEHICLE APPLICATIONS	351
<i>G. Palumbo, A. Piccininni, P. Guglielmi, R. Spina, L. Tricarico, D. Sorgente, G. Russello, A. Vitrano, A. Lo Franco</i>	
WEAR BEHAVIOR OF MOS2 LUBRICANT LAYERS DURING SHEET METAL FORMING.....	357
<i>Bernd-Arno Behrens, Hans Jürgen Maier, Sven Hübner, Christian Bonk, Amer Almohallami, Christin Lummer, Patrick Schein, Hannes Scheland, Moritz Mücke-Camuz</i>	
ADVANCED LASER PATTERNING FOR SECURITY MARKING OF HIGH VALUE METAL COMPONENTS.....	363
<i>J. Yang, L. Pabst, W. Perrie, O. Allegre, G. Dearden, S. P. Edwardson</i>	
REVERSE ANALYSIS OF SCAN STRATEGIES FOR CONTROLLED 3D LASER FORMING OF SHEET METAL	369
<i>H. Gao, G. Sheikholeslami, G. Dearden, S. P. Edwardson</i>	
SURFACE TAILORING OF ALUMINUM SHEETS BY PVD SPUTTERING	375
<i>Fabrizio Quadri, Denise Bellisario, Giovanni Matteo Tedde, Gustavo Santolim, Loredana Santo</i>	
Author Index	