

Table of contents

| | |
|--|----|
| <i>Kurt Steinhoff, Mats Oldenburg, Braham Prakash:</i> Editorial | 1 |
| Materials I | |
| <i>Mats Oldenburg, Paul Åkerström, Greger Bergman, and Per Salomonsson:</i> Simulation of the micro structure evolution in a press hardened component Press hardening, modelling, thermo-mechanical analysis, micro structure | 3 |
| <i>Franz-Josef Lenze, Sascha Sikora, Janko Banik, and Dirk Sauer:</i> Development tendencies as to processing of press hardening under application of coated steel Hot stamping, press hardening, tailored blanks, tailored tempering, MBW _r 1500+AS | 15 |
| <i>Begoña Casas, David Latre, Noemí Rodríguez, and Isaac Valls:</i> Tailor made tool materials for the present and upcoming tooling solutions in hot sheet metal forming | 23 |
| <i>Stefan Goedicke, Stefan Sepsur, Gerald Frenzer, and Christine Breyer:</i> Wet chemical coating materials for hot sheet metal forming - anti scaling and corrosion protection Anti scaling, corrosion protection, coil coating, spot welding, electric conductivity, x-tec | 37 |
| <i>Alexander Bardelcik, Christopher Salisbury, Michael Worswick, and Mary Wells:</i> High strain rate properties of hot formed die quenched boron steel Hot forming, die quenching, boron steel, high strain rate, Johnson-Cook constitutive model, tensile split Hopkinson bar, instrumented falling weight impactor, Gleeble 3500 | 45 |

Process Design I

- Jürgen Lechler and Marion Merklein:* 55
Investigations on forming limits within hot stamping
 Hot stamping, 22MnB5, material characterization, forming limits, Nakajima method
- Bernd-Arno Behrens, Sven Hübner, and Murat Demir:* 63
Conductive heating system for hot sheet metal forming
 Conductive heating system, hot sheet metal forming, press hardening, deep drawing, 22MnB5, heat treatment
- Jens Hardell, Braham Prakash, and Kurt Steinhoff:* 69
High temperature tribological studies on surface engineered tool steel and high strength boron steel
 Tribology, friction, wear, high temperature, surface engineering, coating, nitriding, ultra high strength boron steel, tool steel
- Jens Aspacher:* 77
Form hardening concepts
- Rüdiger Erhardt and Johannes Böke:* 83
Industrial application of hot forming process simulation
 Hot forming, process simulation, thermal mechanical coupling, tool cooling, hardness mapping

Modeling & Simulation I

- Arthur B. Shapiro:* 89
Using LS-DYNA to model hot sheet metal stamping
 LS-DYNA hot stamping, coupled thermal stress, contact resistance, quenching, solid-solid phase change
- Hossein Karbasian, Christain Klimmek, Alexander Brosius and A. Erman Tekkaya:* 97
Numerical process design of hot stamping processes based on optimized thermo-mechanical characteristics
 Hot stamping, high strength steel, thermo-mechanical coupled simulation, design of experiments, 22MnB5
- Michael Kerausch and Thomas Schönbach:* 105
Simulation based development of a hot-forming process layout
 Hot forming, finite element simulation, process design, sensitivity analysis, virtual tryout

Koutaiba Kassem-Manthey, Holger Spiess, and Klaus Wolf: 113
A new approach for a coupled thermal-mechanical simulation of the hot stamping process
 Hot stamping, thermo-mechanical coupled simulation, Indeed, MpCCI

M. Dolores Riera, Miguel G. Coussirat, Alfredo J. Guardo, Isaac Valls, and Daniel Casellas: 119
Simulation of hot stamping processes
 Hot sheet stamping, thermomechanical forming, modeling, simulation

Process Design II / Products

Wolfgang Tillmann, Evelina Vogli, Ingor Baumann, and Fabian Hoffmann: 133
Functional wear resistant tool surfaces for hot metal forming processes
 Hot sheet metal forming, wear, functional PVD coating, multilayers

Till Laumann and Markus Pfestorf: 143
Crash behaviour of various modern steels exposed to high deformation rates
 Hot forming, crash appropriateness, annealing, tailored blanks, evaluation of characteristic values

Uwe Paar, Hans-Helmut Becker, and Michael Alsmann: 153
Press-hardened components from Kassel - chances and challenges
 Press hardening, 22MnB5, coatings, surface characteristics, corrosion behaviour, process design

Daniel Berglund, Krister Amundsson, and Lars-Olof Hellgren: 165
Hot stamped components with soft zones-simulation and validation of material properties and product performance
 Hot stamping, soft zones, simulation, validation, microstructure, mapping, crashworthiness

Materials II

Göran Berglund: 175
The history of hardening of boron steel in Northern Sweden
 Boron, steel, hardening, history, hot forming, roll forming

Ingrid Picas, Ricardo Hernández, Daniel Casellas, Begoña Casas, and Isaac Valls: 179
Tool performance in cutting of hot stamped steels
 Tool steel, microstructure, carbides, fatigue, wear

- Manuel Maikranz-Valentin, Nicolas Saba, Ursula Weidig, Rüdiger Weißner, and Kurt Steinhoff:* 191
Hot forming of work hardened steel
 Press hardening, thermo-mechanical processing, high strength steel
- Josef Faderl, Thomas Manzenreiter, and Karl Michael Radlmayr:* 199
Press hardening of hot dip galvanized 22MnB5: A stable and reproducible process
- Michael Braun and Cord Schöffner:* 207
Hot sheet metal forming - R&D along the process chain inside the Salzgitter group
 Component-properties, sample-sizes, scale-protection, x-tec, welding, fatigue
- ## Process Design III
- Christine Dessain, Philipp Hein, Joël Wilsius, Luc Penazzi, Christine Boher, and Jan Weikert:* 217
Experimental investigation of friction and wear in hot stamping of Usibor 1500P
 Friction, wear, hot stamping, Usibor 1500P, high temperature, tool steel, high strength boron steel, heating resistance, abrasion, adhesion, contact pressure
- Leire Vadillo, Angela Mangas, Jose Ignacio Zarazua, Beatriz González, María Angeles Gutiérrez, Uwe Paar, and Vitoon Uthaisangsuk:* 229
Hybrid method for low pressure forming of boron alloyed steels
 Tube, gas, blowing, boron, steel, draw-in, plasticity, temperature
- Ralf Kolleck, Robert Veit, Harald Hofmann, and Franz-Josef Lenze:* 239
Alternative heating concepts for hot sheet metal forming
 Heating technologies, induction heating, conduction heating, roller hearth furnaces
- Harald Lehmann and Rolf Schwartz:* 247
Roller hearth furnaces for hot-form hardening
 Roller hearth furnace, heat treatment, micro press hardening facility, controlled furnace atmosphere
- ## Modeling & Simulation II
- Martin Jonsson:* 253
Press hardening, from innovation to global technology

| | |
|--|-----|
| <i>David Lorenz and André Haufe:</i> | 257 |
| Recent advances in hot forming simulation with LS-DYNA | |
| <i>Per Salomonsson, Mats Oldenburg, Paul Åkerström, and Greger Bergman:</i> | 267 |
| Experimental and numerical evaluation of the heat transfer coefficient in press hardening | |
| Hot stamping, press hardening, heat transfer coefficient, experimental, inverse modelling | |
| <i>I. Neubauer, K. Hübner, and T. Wicke:</i> | 275 |
| Thermo-mechanically coupled analysis: the next step in sheet metal forming simulation | |
| Thermo-mechanical coupling, hot sheet metal forming, numerical simulation, phase transformation | |
| <i>Bernd-Arno Behrens, Philipp Olle:</i> | 285 |
| Validation of a material model for process simulation of hot stamping | |
| Numerical simulation, material model, phase transformation, transformation-induced stresses, transformation-induced plasticity | |
| Process Design IV | |
| <i>Thomas Stoehr, Marion Merklein, and Jürgen Lechler:</i> | 293 |
| Determination of frictional and thermal characteristics for hot stamping with respect to a numerical process design | |
| Hot stamping, 22MnB5, process characteristics, heat transfer coefficient, friction coefficient | |
| <i>H.G. Kim, H.S. Son, T.H. Kim, B.K. Choi, M.K. Park, and Y.R. Cho:</i> | 301 |
| CAE based hot press forming die design | |
| Hot press forming, die design, forming simulation, flow simulation, cooling simulation, structure simulation, wear simulation | |
| <i>Eike Gerhard Gückler and Göran Berglund:</i> | 311 |
| From profile hardening to custom made components | |
| Hot formed profiles, formblow-hardening, simulation, scalable design, partial hardening | |