

---

# Contents

## Part 1 Best Paper

<b>1 Research and Demonstration Center for the Production of Large-Area Lithium-Ion Cells . . . . .</b>	<b>3</b>
G.Reinhart, T. Zeilinger, J. Kurfer, M. Westermeier, C. Thiemann, M. Glonegger, M. Wunderer, C. Tammer, M. Schweier, and M. Heinz	
<b>2 Flexible Manufacturing of Lightweight Frame Structures with an Integrated Process Chain . . . . .</b>	<b>13</b>
D. Pietzka and E. Tekkaya	
<b>3 Production System with Respect for Variable Quantities for an Economical Electric Vehicle Production . . . . .</b>	<b>21</b>
G. Schuh, J. Arnoscht, C. Nee, and B. Schittny	
<b>4 Topology-Optimized Implants: Medical Requirements and Partial Aspects of a Design Engineering Process Chain . . . . .</b>	<b>33</b>
R. Neugebauer, C. Rotsch, S. Scherer, M. Werner, A. Böhm, T. Töppel, J. Bräunig, and B. Senf	
<b>5 Automated Approach to Exchange Energy Information . . . . .</b>	<b>47</b>
J. Schlechtendahl, P. Eberspächer, S. Schrems, P. Sekler, A. Verl, and E. Abele	

## Part 2 Electric Mobility

<b>6 Intelligent Onboard Networks for the Flexible Production of Electric Vehicles . . . . .</b>	<b>57</b>
J. Brix, M. Merdes, A. Schäfer, R. Wößner, and J. Stallkamp	
<b>7 Integrated Product and Factory Design for Lithium-Ion Batteries . . . . .</b>	<b>65</b>
A. Kampker, B. Franzkoch, C. Nowacki, and H. Heimes	
<b>8 Modular Chassis Product Platform Considering Variable Quantities for an Economical Electric Vehicle Production . . . . .</b>	<b>73</b>
G. Schuh, J. Arnoscht, S. Rudolf, and K. Korthals	
<b>9 Method to Determine and Quantify Changes in Value Chains Caused by E-Mobility . . . . .</b>	<b>83</b>
W. Sihm, D. Palm, H. Gommel, W. Tober, and C. Bauer	
<b>10 A Workshop-Centered Battery Exchange System for Electric Vehicles . . . . .</b>	<b>89</b>
A. Rost, J.-P. Schuh, K. Pfeiffer, and A. Verl	

- 11 E-Antrieb.Net: Development and Production Environment for Electric Drive Trains in a SME Focused Network . . . . . 99**  
 G. Schuh, A. Kampker, T. Vogels, C. Nowacki, R. Schmitt, M. Harding  
 D.U. Sauer, M. Ecker, B. Ponick, A. Brune, A. Mertens, and B. Ullrich

### **Part 3 Lightweight Construction**

- 12 Machining of  $\beta$ -Titanium Under Cryogenic Conditions: Process Cooling by CO<sub>2</sub>-Snow . . . . . 109**  
 C. Machai, H. Abrahams, and D. Biermann
- 13 Smart Semi-finished Parts for the Application in Sheet-Metal Structures . . . 121**  
 R. Neugebauer, L. Lachmann, W.-G. Drossel, M. Nestler, and S. Hensel
- 14 Novel Robot-Based End-Effector Design for an Automated Preforming of Limb Carbon Fiber Textiles . . . . . 131**  
 G. Reinhart and C. Ehinger
- 15 Manufacturing Technologies for Lightweight Applications with Thermoplastic Textile-Reinforced Sandwich Structures . . . . . 143**  
 K. Großmann, A. Mühl, C. Cherif, K.-H. Modler, F. Adam, and M. Krah
- 16 Automated Manufacturing of Fiber-Reinforced Thermoplastic 3D-Lightweight Components . . . . . 153**  
 C. Brecher, M. Emonts, M. Dubratz, and A. Kermer-Meyer
- 17 Lightweight Products by Load Optimized Profile Design . . . . . 161**  
 M. Storbeck, P. Beiter, S. Berner, M. Brenneis, W. Schmitt, and P. Groche
- 18 Improvement of Denting Behavior of Aluminum Sheet by Pre-stretching . . . 181**  
 A. Werber and M. Liewald

### **Part 4 Mass Production Ability**

- 19 Diamond Machining of Nitrocarburized Steel Molds for the Mass Production of Optical Components . . . . . 191**  
 E. Brinksmeier, R. Gläbe, and J. Osmer
- 20 Square Foot Manufacturing: A New Approach for Desktop-Sized Reconfigurable Machine Tools . . . . . 201**  
 J.P. Wulfsberg, P. Kohrs, S. Grimske, and B. Röhlig
- 21 Mobile Camera for Measuring and Testing in the Working Area of Machine Tools . . . . . 209**  
 E. Hohwieler, R. Feitscher, and E. Uhlmann
- 22 Modelling the Costs of Autonomous Logistics . . . . . 221**  
 B. Scholz-Reiter, S. Sowade, and M. Teucke
- 23 Dealing with the Need for Flexibility and Economies of Scope in Global Production Network Design . . . . . 233**  
 G. Schuh, J. Nöcker, R. Varandani, J. Schwartz, and R. Schilling

<b>24</b>	<b>EMOTIO: Systematic Customer Integration into the Process of Innovation</b> . . . . .	<b>241</b>
	R. Schmitt, S. Humphrey, and M. Köhler	
<b>25</b>	<b>Assembly Oriented Design Method for Reconfigurable Processes and Equipment</b> . . . . .	<b>251</b>
	R. Müller, M. Esser, and J. Eilers	

## **Part 5 Medical Technology**

<b>26</b>	<b>CoCr Is Not the Same: CoCr-Blanks for Dental Machining</b> . . . . .	<b>261</b>
	B. Karpuschewski, H.J. Pieper, M. Krause, and J. Döring	
<b>27</b>	<b>Polyamide 12: Carbon Nanotube Composite Material Under the Aspect of Future Application as Balloon Catheter Material</b> . . . . .	<b>275</b>
	M. Ghahremanpour, G. Lorenz, T. Wörsching, M. Bogner, I. Maier, M. Detert, J. Sägebarth, and H. Sandmaier	
<b>28</b>	<b>Manufacturing of Individualized Cranial Implants Using Two Point Incremental Sheet Metal Forming</b> . . . . .	<b>287</b>
	A. Göttmann, M. Korinth, V. Schäfer, B.T. Araghi, M. Bambach, and G. Hirt	
<b>29</b>	<b>Fiber-Reinforced Plastics Enable New Prospects for Minimal Invasive Devices and Interventions</b> . . . . .	<b>297</b>
	C. Brecher, M. Emonts, A. Schütte, and A. Brack	
<b>30</b>	<b>Development, Simulation-Based Design and Metal Forming Production of Patient-Individual Hip Cups</b> . . . . .	<b>307</b>
	B.-A. Behrens, N. Weigel, S.B. Escobar, C. Stukenborg-Colsman, M. Lerch, I. Nolte, P. Wefstaedt, and A. Bouguecha	
<b>31</b>	<b>IES: Instrument Exchange System for Minimally Invasive Surgery</b> . . . . .	<b>315</b>
	D. Kaltenbacher, T. Cuntz, A. Pfaud, K. Fischer, A. Domnich, and J. Stallkamp	
<b>32</b>	<b>Adjusting the Subsurface Properties of Biocompatible Magnesium–Calcium Alloys as Absorbable Implant Material by Machining Processes</b> . . . . .	<b>321</b>
	B. Denkena, J. Köhler, and A. Lucas	

## **Part 6 Resource Efficiency**

<b>33</b>	<b>Achieving Energy Efficient Process Chains in Sheet Metal Forming</b> . . . . .	<b>331</b>
	J. Schönherr	
<b>34</b>	<b>Energy Value Stream: Increasing Energy Efficiency in Production</b> . . . . .	<b>343</b>
	K. Erlach	
<b>35</b>	<b>Influencing Densification of PM Gears</b> . . . . .	<b>351</b>
	F. Klocke, C. Gorgels, P. Kauffmann, and E. Gräser	
<b>36</b>	<b>Model-Based Planning of Resource Efficient Process Chains Using System Entity Structures</b> . . . . .	<b>361</b>
	R. Larek, E. Brinksmeier, T. Pawletta, and O. Hagendorf	
<b>37</b>	<b>Aluminum Scrap Recycling Without Melting</b> . . . . .	<b>373</b>
	K. Pantke, V. Güley, D. Biermann, and A.E. Tekkaya	

- 38 Virtual Production Systems: Simulating the Energy Consumption  
of Machine Tools . . . . . 379**  
C. Brecher, S. Bäuml, and J. Trieb
- 39 Economical and Function-Oriented Manufacturing of Cylinder  
Running Surfaces of Internal Combustion Engines . . . . . 389**  
B. Karpuschewski, H.-J. Pieper, and F. Welzel

Future Trends in Production Engineering  
Proceedings of the First Conference of the German  
Academic Society for Production Engineering (WGP),  
Berlin, Germany, 8th-9th June 2011  
Schuh, G.; Neugebauer, R.; Uhlmann, E. (Eds.)  
2013, XVIII, 398 p., Hardcover  
ISBN: 978-3-642-24490-2