Table of Contents

Preface

Chapter 1: Energy Efficiency as an Element of a Strategy for Sustainable Production

M. Brandmeier, A. Krinner and J. Franke	3
A Comparison of Indicators for Self-Sufficient Energy Systems E. Unterberger, A. Wolf and G. Reinhart	11
A Method and a Software-Tool for Comparing Inbound Logistics Systems in Respect of Energy Consumption M. Serno, C. Renz, S. Endrizzi, P. Schuderer and J. Franke	20
The Least Energy Demand as Crossbench Reference for the Evaluation and Equation of the	20
Relative Energy Efficiency of Production Processes S. Kreitlein, F. Ultsch, F. Baumhoer and J. Franke	31
Calculation of the Least Energy Demand as Energy Benchmark for Applied Production Processes Based on the Unit Operation Model S. Kreitlein, F. Baumhoer, F. Ultsch and J. Franke	39
The Physical Model Concept for the Determination of the Least Energy Demand as Energy Efficiency Benchmark for Production Processes S. Kreitlein, F. Baumhoer, F. Ultsch and J. Franke	49
A Model-Based Approach for the Energy Monitoring of Handling Machines Paryanto, M. Brossog, M. Roppelt and J. Franke	57
Comparison of Prognosis Methods for the Energy Consumption of Machines and Further Development with Regard to Increasing Data Availability T. Müller, J.S. Tauschek, J. Glasschröder and G. Reinhart	64
Lean Data Services: Detection of Operating States in Energy Profiles of Intralogistics Systems by Using Big Data Analytics C. Oette, T. Küfner, A. Reger and J. Boehner	73
Potentials for Energy Saving and Quality Improvement of Assembly Presses Using Data	
Mining C. Sand, M. Seidl, C. Leinauer, M. Neuner, M. Meiners, S. Baumann and J. Franke	82
A Lean-Based Key Performance Analysis for a Resource Efficient Soldering Oven in Electronics Production	0.1
A. Esfandyari, D. Sattler, A. Syed-Khaja and J. Franke	91
Efficient Method for Optimizing Calcium Silicate Masonry Unit Manufacturing Using Simulation-Based Optimization and Decomposition T. Donhauser, J. Lohse, J. Franke and P. Schuderer	99
Economical Comparison of Packaging Machines: A New Approach Based on an Economic	
Evaluation Model G. Götz, M. Rohrhirsch, C. Gebbe, C. Richter and G. Reinhart	109
E Flow - Decentralized Computer Architecture and Simulation Models for Sustainable and Resource Efficient Intralogistics M. Scholz, S. Kreitlein and J. Franke	117
Process and Energy Data Acquisition on Machining Center and Individual Machine	117
Components J. Müller, G. Michos, L. Koch, M. Hermann, M. Hubert and J. Franke	123
Simulation Based Studies of Energy Saving Measures in the Aluminum Tool and Die	
Casting Industry M. Henninger, W. Schlüter, D. Jeckle and J. Schmidt	131

Chapter 2: Equipments and Processing Technologies of Sustainable Production

Analysing the Tribological Behaviour of DLC-Coated Dry-Running Deep Groove Ball Bearings with Regard to the Ball Material J. Kröner, S. Kursawe, Y. Musayev and S. Tremmel	143
Assessment of Process Improvement Potential of Carbon Dioxide as a Cryogenic for	113
Machining Operations D. Gross, A. Heinz, M. Ebner and N. Hanenkamp	151
Developing a Composites Trailer for Multi-Purpose Sports Activities B. Thorenz, M. Klein, T. Mueller, J. Boehner and R. Steinhilper	159
Strength Calculation and Design Optimization of a Test Rig for Slide Ring Seals in the Scope of Rotary Manifolds J. Müller, G. Michos, L. Koch, M. Hubert and J. Franke	166
Efficient and Noise Reduced Design of a Side Channel Blower Considering Psychoacoustic Evaluation Criteria	
S. Münsterjohann, F. Zenger and S. Becker Efficient and Noise Reduced Design of Axial Fans Considering Psychoacoustic Evaluation	174
Criteria F. Zenger, S. Münsterjohann and S. Becker Engager Efficient Manufacturing of Payron Floring Substitutes through Salacting Lagran	181
Energy Efficient Manufacturing of Power Electronics Substrates through Selective Laser Melting Technology A. Syed-Khaja, J. Stecher, A. Esfandyari, S. Kreitlein and J. Franke	188
Energy Efficient Strategies for Processing Rare Earth Permanent Magnets A. Meyer, C. Ringelhan, C. Fischer and J. Franke	195
Increasing the Format-Flexibility of Packaging Machines: Experimental Study on Laser Beam Sealing and Cutting G. Götz, J. Fink, C. Richter and G. Reinhart	201
Investigation and Prognosis of Waste Heat Occurrence during the Extrusion Process of Tubular Profiles	
H. Reichel and R. Krause	209
Investigation of Different Sintering Methods on Ink-Jet-Printed Conductive Structures J. Bahr, O. Kravchuk and M. Reichenberger	217
Joining Technologies for Material Substitution by Using Carbon Fiber Reinforced Plastics J. Boehner, J. Jahn, M. Klein and R. Steinhilper	224
Quantifying Powder Losses and Analyzing Powder Conditions in order to Determine Material Efficiency in Laser Beam Melting M. Lutter-Günther, A. Hofmann, C. Hauck, C. Seidel and G. Reinhart	231
The Impact of Pressure Regulators on the Runtime and Energy Savings of Supersonic Blowdown Wind Tunnels P. Epple, M. Steppert and M. Steber	238
Feature Extraction and Classification of the Electric Current Signal of an Induction Motor for Condition Monitoring Purposes C. Gebbe, C. Tran, F. Lingenfelser, J. Glasschröder and G. Reinhart	244
c. George, c. 11an, 1. Emgenicion, v. Giassemouri and G. Reimatt	~