



Maximum Deformation

Spring-Back

Design Optimization Of Springback In A Deepdrawing Process

Tobias Bleicker



Design Optimization Of Springback In A Deepdrawing Process:

Advances in Computational Methods in Manufacturing R. Ganesh Narayanan, Shrikrishna N. Joshi, Uday Shanker Dixit, 2019-10-17 This volume presents a selection of papers from the 2nd International Conference on Computational Methods in Manufacturing ICCMM 2019 The papers cover the recent advances in computational methods for simulating various manufacturing processes like machining laser welding laser bending strip rolling surface characterization and measurement Articles in this volume discuss both the development of new methods and the application and efficacy of existing computational methods in manufacturing sector This volume will be of interest to researchers in both industry and academia working on computational methods in manufacturing Springback Assessment and Compensation of Tailor Welded Blanks Ab Abdullah, MF Jamaludin, 2022-12-27 Focusing on techniques developed to evaluate the forming behaviour of tailor welded blanks TWBs in sheet metal manufacturing this edited collection details compensation methods suited to mitigating the effects of springback Making use of case studies and in depth accounts of industry experience this book gives a comprehensive overview of springback and provides essential solutions necessary to modern day automotive engineers Sheet metal forming is a major process within the automotive industry with advancement of the technology including utilization of non uniform sheet metal in order to produce light or strengthened body structures This is critical in the reduction of vehicle weight in order to match increased consumer demand for better driving performance and improved fuel efficiency Additionally increasingly stringent international regulations regarding exhaust emissions require manufacturers to seek to lighten vehicles as much as possible To aid engineers in optimizing lightweight designs this comprehensive book covers topics by a variety of industry experts including compensation by annealing low power welding punch profile radius and tool integrated springback measuring systems It ends by looking at the future trends within the industry and the potential for further innovation within the field This work will benefit car manufacturers and stamping plants that face springback issues within their production particularly in the implementation of TWB production into existing facilities It will also be of interest to students and researchers in automotive and aerospace engineering *Computational Methods and Production Engineering* J. Paulo Davim, J Paulo Davim, 2017-05-25 Computational Methods and Production Engineering Research and Development is an original book publishing refereed high quality articles with a special emphasis on research and development in production engineering and production organization for modern industry Innovation and the relationship between computational methods and production engineering are presented Contents include Finite Element method FEM modeling simulation Artificial neural networks ANNs Genetic algorithms Evolutionary computation Fuzzy logic neuro fuzzy systems Particle swarm optimization PSO Tabu search and simulation annealing and optimization techniques for complex systems As computational methods currently have several applications including modeling manufacturing processes monitoring and control parameters optimization and computer aided process planning this book is an ideal resource for

practitioners Presents cutting edge computational methods for production engineering Explores the relationship between applied computational methods and production engineering Presents new innovations in the field Edited by a key researcher in the field

Deformation-Based Processing of Materials Heng Li,Mingwang Fu,2019-03-07 Deformation Based Processing of Materials Behavior Performance Modeling and Control focuses on deformation based process behaviors and process performance in terms of the quality of the needed shape geometries and the requested properties of the deformed products In addition modelling and simulation is covered to create an in depth and epistemological understanding of the process Other topics discussed include ways to efficiently reduce or avoid defects and effectively improve the quality of deformed parts The book is ideal as a technical document but also serves as scientific literature for engineers scientists academics research students and management professionals involved in deformation based materials processing Covers process behaviors such as non uniform deformation unstable deformation material flow phenomena and process performance Includes modelling and simulation of the entire deformation process Looks at control of the preferred deformation undesirable material flow avoidance and reduction of defects and improving the dimensional accuracy surface quality and microstructure construction of the produced products

Computational Structural Engineering Yong Yuan,Junzhi Cui,Herbert A. Mang,2009-06-05 Following the great progress made in computing technology both in computer and programming technology computation has become one of the most powerful tools for researchers and practicing engineers It has led to tremendous achievements in computer based structural engineering and there is evidence that current developments will even accelerate in the near future To acknowledge this trend Tongji University Vienna University of Technology and Chinese Academy of Engineering co organized the International Symposium on Computational Structural Engineering 2009 in Shanghai CSE 09 CSE 09 aimed at providing a forum for presentation and discussion of state of the art development in scientific computing applied to engineering sciences Emphasis was given to basic methodologies scientific development and engineering applications Therefore it became a central academic activity of the International Association for Computational Mechanics IACM the European Community on Computational Methods in Applied Sciences ECCOMAS The Chinese Society of Theoretical and Applied Mechanics the China Civil Engineering Society and the Architectural Society of China A total of 10 invited papers and around 140 contributed papers were presented in the proceedings of the symposium Contributors of papers came from 20 countries around the world and covered a wide spectrum related to the computational structural engineering

Smart Technologies for Energy, Environment and Sustainable Development Mohan Lal Kolhe,Pawan Kumar Labhassetwar,H. M. Suryawanshi,2019-07-02 This book comprises select proceedings of the International Conference on Smart Technologies for Energy Environment and Sustainable Development ICSTEESD 2018 The chapters are broadly divided into three focus areas viz energy environment and sustainable development and discusses the relevance and applications of smart technologies in these fields A wide variety of topics such as renewable energy energy conservation and management

energy policy and planning environmental management marine environment green building smart cities smart transportation are covered in this book Researchers and professionals from varied engineering backgrounds contribute chapters with an aim to provide economically viable solutions to sustainable development challenges The book will prove useful for academics professionals and policy makers interested in sustainable development

Dynamic Methods and Process Advancements in Mechanical, Manufacturing, and Materials Engineering Davim, J. Paulo, 2012-07-31 Engineering and design are often a necessary steps for an industry to become effective Industry modeling can help to bridge the communication gap among engineers and system designers Dynamic Methods and Process Advancements in Mechanical Manufacturing and Materials Engineering examines the principles of physics and materials science for analysis design manufacturing and maintenance of mechanical equipments and systems Targeting researchers practitioners and academicians this volume promotes innovative findings in mechanical manufacturing and materials engineering

Intelligent Robotics and Applications Xin-Jun Liu, Zhenguo Nie, Jingjun Yu, Fugui Xie, Rui Song, 2021-10-17 The 4 volume set LNAI 13013 13016 constitutes the proceedings of the 14th International Conference on Intelligent Robotics and Applications ICIRA 2021 which took place in Yantai China during October 22 25 2021 The 299 papers included in these proceedings were carefully reviewed and selected from 386 submissions They were organized in topical sections as follows Robotics dexterous manipulation sensors actuators and controllers for soft and hybrid robots cable driven parallel robot human centered wearable robotics hybrid system modeling and human machine interface robot manipulation skills learning micro_nano materials devices and systems for biomedical applications actuating sensing control and instrumentation for ultra precision engineering human robot collaboration robotic machining medical robot machine intelligence for human motion analytics human robot interaction for service robots novel mechanisms robots and applications space robot and on orbit service neural learning enhanced motion planning and control for human robot interaction medical engineering

Validation and Robust Optimization of Deep Drawing Process by Simulation in the Presence of Uncertainty Von Dim Nguyen, 2015 The ultimate objective of this thesis is to evaluate the possibility to validate and optimize a manufacturing process using numerical simulation and taking into account the irreducible uncertainties in the process materials and geometry of manufactured product Taking into account the uncertainties requires quantifying the effects of variations of model parameters on the outputs by propagating these variations via computer simulation to assess their effects on the outputs In this work we have proposed a procedure to determine the sensitivity threshold of the numerical model to build numerical Design of Experiments consistent with this threshold We have also shown that given the uncertainties in the materials and the geometry of the product it is possible to optimize certain process parameters to control the effects of uncertainties on the dimensional and morphological variations of the product For this we have proposed an optimization procedure based on NSGA II algorithm and a meta modeling of the process The application for deep drawing of a U shaped sheet metal part springback included shows that it is a robust design

problem for which we get all the compromise between the deviation from the mean and standard deviation of a performance depending on the process correctly chosen Finally the analysis of these results allows us to quantify the relationship between the notion of robustness of an optimized solution of the process and criteria for measuring the quality of the product

Numerical Simulation of 3D Sheet Metal Forming Processes Lorenzo M. Smith, Li Zhang, Chuan-Tao Wang, Ming F. Shi, Jeong-Whan Yoon, Thomas B. Stoughton, Jian Cao, Farhang Pourboghrat, 2005-08-19 The Numisheet Conferences occur once every three years alternating in location between North America Europe and Asia The conference attracts international participation from the metal forming industry and university professors interested in sheet metal forming technology with a strong emphasis on forming simulation Although the conference is dominated by the automotive industry the conference has a wider appeal drawing contributions from the aircraft and canning industries as well The Numisheet Conference Proceedings include the latest developments in metal forming technology which is a rapidly growing and challenging opportunity for application of science to industry The developments are described in over 125 papers included in Part A of the proceedings In addition this volume includes the Numisheet Keynote Program which focused on cutting areas of technology and was presented by selected leading scientists in the field of metal forming One of the hallmarks of the conference is the Numisheet Benchmark Study which is a set of three blind tests prepared one year prior to the conference Participants are invited to submit their predictions of how selected types of sheet metal will deform under large plastic deformation during the manufacture of actual automotive products and laboratory test specimens The complete specifications and results of this blind test are described in Part B of the proceedings

Advances in Design Automation, 1991: Design automation and design optimization Gary A. Gabriele, 1991

Investigations for Warm Forming of Lightweight Sheet Materials Hongseok Kim, 2005

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Sheet Metal 2005 Manfred Geiger, Joost R. Duflou, H.J.J. Kals, Bez Shirvani, U.P. Singh, 2005-05-15 Proceedings of the 11th International Conference on Sheet Metal 2005 held at the Friedrich Alexander University Erlangen Nrnberg Germany 08 08 April 2005

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