Sheet Metal Forming Processes Constitutive Modelling And Numerical Simulation 1 Ed 10

Bringing together the world's leading researchers and practitioners of computational mechanics, these new volumes meet and build on the eight key challenges for research and development in computational mechanics. Researchers have recently identified eight critical research tasks facing the field of computational mechanics. These tasks have come about because it appears possible to reach a new level of mathematical modelling and numerical solution that will lead to a much deeper understanding of nature and to great improvements in engineering design. The eight tasks are: The automatic solution of mathematical models Effective numerical schemes for fluid flows The development of an effective mesh-free numerical solution method The development of numerical procedures for multiphysics problems The development of numerical procedures for multiscale problems The modelling of uncertainties The analysis of complete life cycles of systems Education - teaching sound engineering and scientific judgement Readers of Computational Fluid and Solid Mechanics 2003 will be able to apply the combined experience of many of the world's leading researchers to their own research needs. Those in academic environments will gain a better insight into the needs and constraints of the industries they are involved with; those in industry will gain a competitive advantage by gaining insight into the cutting edge research being carried out by colleagues in academia. Features Bridges the gap between academic researchers and practitioners in industry Outlines the eight main challenges facing Research and Design in Computational mechanics and offers new insights into the shifting the research agenda Provides a vision of how strong, basic and exciting education at university can be harmonized with life-long learning to obtain maximum value from the new powerful tools of analysis

This book contains the most relevant papers presented in the International Conference on Materials Forming, ESAFORM 2005. It gathers selected plenary and keynote papers presented in the conference, offering an up-to-date synthesis of the academic and industrial research in the fields of physical and numerical modeling of materials forming processes.

This volume records the proceedings of an international symposium on "ME CHANICS OF SHEET METAL FORMING: Material Behavior and Deformation Analysis." It was sponsored and held at the General Motors Research Labora tories on October 17-18, 1977. This symposium was the twenty-first in an annual series. The objective of this symposium was to discuss the research frontiers in experimental and theoretical methods of sheet metal forming analysis and, also, to determine directions of future research to advance technology that would be useful in metal stamping plants. Metal deformation analyses which provide guide lines for metal flanging are already in use. Moreover, recent advances in computer techniques for solving plastic flow equations and in measurements of material parameters are leading to dynamic models of many stamping operations. These models would accurately predict the stresses and strains in the sheet as a function of punch travel. They would provide the engineer with the knowledge he needs to improve die designs. The symposium papers were organized into five sessions: the state of the art, constitutive relations of sheet metal, role of friction, sheet metal formability, and deformation analysis of stamping operations. We believe this volume not only summarizes the various viewpoints at the time of the symposium, but also pro vides an outlook for materials and mechanics research in the future.

Over the last 15 years, the application of innovative steel concepts in the automotive industry has increased steadily. Numerical simulation technology of hot forming of high-strength steel allows engineers to modify the formability of hot forming steel metals and to optimize die design schemes. Theories, Methods and Numerical Technology of Sheet Metal Cold and Hot Forming focuses on hot and cold forming theories, numerical methods, relative simulation and experiment techniques for high-strength steel forming and die design in the automobile industry. Theories, Methods and Numerical Technology of Sheet Metal Cold and Hot Forming introduces the general theories of cold forming, then expands upon advanced hot forming theories and simulation methods, including: the forming process, constitutive equations, hot boundary constraint treatment, and hot forming equipment and experiments. Various calculation methods of cold and hot forming, based on the authors’ experience in commercial CAE software for sheet metal forming, are provided, as well as a discussion of key issues, such as hot formability with quenching process, die design and cooling channel design in die, and formability experiments. Theories, Methods and Numerical Technology of Sheet Metal Cold and Hot Forming will enable readers to develop an advanced knowledge of hot forming, as well as to apply hot forming theories, calculation methods and key techniques to direct their die design. It is therefore a useful reference for students and researchers, as well as automotive engineers.

An exact and fast estimation of special material characterisation data and the implementation and usage of these data for finite element simulations are essential for the control of forming processes of special parts from thin sheet metals. This report describes a method to determine the necessary material parameters for the sheet metal forming simulation by means of optimisation algorithms. For the chosen steel grades IF-DCO4, DP500, ZStE340 and AK-DCO4 it is demonstrated how this method works and where its limitations have to be considered. The findings are based on extended material tests, numerous measurements on reference and real parts, and in-depth numerical sensitivity studies on the developed optimisation algorithm. The special simulation programme material parameters delivered from the optimisation process are used to investigate the appropriateness of different material models for the prediction of physically based material parameters. From that, a strategy for the identification of constitutive parameters for sheet metal forming simulations is derived.

The interest in finite element method as a solution technique of the computer age is reflected in the availability of many general and special purpose software based on this technique. This work aims to provide a complete and detailed explanation of the basics of the application areas.

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

This book provides a comprehensive introduction to the unique theory developed over years of research on materials and process modelling and its application in metal forming technologies. It starts with the introduction of fundamental theories on the mechanics of materials, computational mechanics and the formulation of unified constitutive equations. Particular attention is paid to elastic–plastic formulations for cold metal forming and unified elastic–viscoplastic constitutive equations for warm/hot metals processing. Damage in metal forming and numerical techniques to solve and determine the unified constitutive equations are also detailed. Examples are given for the application of the unified theories to solve practical problems encountered in metal forming processes. This is particularly useful to predict microstructure evolution in warm/hot metal forming processes. Crystal plasticity theories and modelling techniques with their applications in micro-forming are also introduced in the book. The book is self-contained and unified in presentation. The explanations are highlighted to capture the interest of curious readers and complete enough to provide the necessary background material to further explore/develop new theories and applications.

This volume contains about 180 papers including seven keynotes presented at the 7th NUMIFORM Conference. It reflects the state-of-the-art of simulation of industrial forming processes such as rolling, forging, sheet metal forming, injection moulding and casting.

This collection of peer-reviewed papers covers the latest advances in, and applications of: computer-aided design, manufacturing and engineering, innovative design methodologies, advanced manufacturing technologies, equipment manufacturing, automation equipment, and other related topics; making this a definitive guide to these topics.

This two-volume set of technical articles on materials science represents the proceedings of the Fifteenth Conference of the European Scientific Association for Material Forming held in Erlangen, Germany during March, 2012. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 227 peer-reviewed papers are grouped into the chapters: Keynotes; Formability of Metallic Materials; Forging and Rolling; Composite-Forming Processes; Semi-Solid Processes; Lightweight Design and Energy Efficiency in Metal Forming; New and Advanced Numerical Strategies for Material Forming; Extrusion and Drawing; Friction and Wear in Material Processing; Nano-Structured Materials and Microforming; Inverse Analysis Optimization and Stochastic Approaches; Constitutive Models for Metallic Alloys (Multiscale and Continuum); Innovative Joining by Forming Technologies; Incremental and Sheet-Metal Forming; Sheet-Bulk-Metal Forming; Heat Transfer Modelling; Structures, Properties and Processing of Polymers; Non-Conventional Processes; Machining and Cutting; Integrated Design, Modelling and Reliability Assessment in Forming (I-DMR).

This edited book contains extended research papers from AIMTDR 2014. This includes recent research work in the fields of friction stir welding, sheet forming, joining and forming, modeling and simulation, efficient prediction strategies, micro-manufacturing, sustainable and green manufacturing issues etc. This will prove useful to students, researchers and practitioners in the field of materials forming and manufacturing.

An all-in-one guide to the theory and applications of plasticity in metal forming, featuring examples from the automobile and aerospace industries Provides a solid grounding in plasticity fundamentals and material properties Features models, theorems and analysis of processes and relationships related to plasticity, supported by extensive experimental data Offers a detailed discussion of recent advances and applications in metal forming

The aim of this major reference work is to provide a first point of entry to the literature for the researchers in any field relating to structural integrity in the form of a definitive research/reference tool which links the various sub-disciplines that comprise the whole of structural integrity. Special emphasis will be given to the interaction between mechanics and materials and structural integrity applications. Because of the interdisciplinary and applied nature of the work, it will be of interest to mechanical engineers and materials scientists from both academic and industrial backgrounds including bioengineering, interface engineering and nanotechnology. The scope of this work encompasses, but is not restricted to: fracture mechanics, fatigue, creep, materials, dynamics, environmental degradation, numerical methods, failure mechanisms and damage mechanics, interfacial fracture and nano-technology, structural analysis, surface behaviour and heart valves. The structures under consideration include: pressure vessels and piping, off-shore structures, gas installations and pipelines, chemical plants, aircraft, railways, bridges, plates and shells, electronic circuits, interfaces, nanotechnology, artificial organs, biomaterial prostheses, cast structures, mining... and more. Case studies will form an integral part of the work.

60 novel approaches in metal forming are presented and explained in detail. Contributions from acknowledged international scientists representing the state-of-art in metal forming open a general view on recent results and a clear view on demands for new research initiatives.

This book groups the main advances in material forming, considering different processes, both conventional and non-conventional. It focuses on polymers, composites and metals, which are analyzed from the state of the art. Special emphasis is devoted to the contributions of the European Scientific Association for Material Forming (ESAFORM) during the last decade and in particular the ones coming from its annual international conference.

Laser welding is a high-energy process used in a wide range of advanced materials to obtain micro- to macro-sized joints in both similar and dissimilar combinations. Moreover, this technique is widely used in several industries, such as automotive, aerospace, and medical industries, as well as in electrical devices. Although laser welding has been used for several decades, significant and exciting innovations often arise from both the process and/or advanced materials side.

The book gives a synthetic presentation of the research performed during more than twenty years by the members of the Research Centre on Sheet Metal Forming a" CERTETA (Technical University of Cluj-Napoca, Romania). The first chapter reminds some fundamental topics of the theory of plasticity. A more extended chapter is devoted to the presentation of the phenomenological yield criteria, emphasizing the formulations proposed by the CERTETA team (BBC models). The sheet metal formability is discussed in a separate chapter. After presenting the methods used for the formability assessment, the discussion focuses on the forming limit curves. In this context, the authors emphasize their contributions to the mathematical modeling of forming limit curves. The aspects related to the implementation of the constitutive models in finite-element codes are discussed in the last chapter of the book. The performances of the models are proved by the numerical simulation of various sheet metal forming processes: hydroforming, deep-drawing and bending. The book is useful for the students, doctoral fellows, researchers and engineers who are mainly interested in the mechanical modeling and numerical simulation of sheet metal forming processes.

AEPA '96 provides a forum for discussion on the state-of-art developments in plasticity. An emphasis is placed on the close interaction of the theories from macroplasticity, mesoplasticity and microplasticity together with their applications in various engineering disciplines such as solid mechanics, metal forming, structural analysis, geo-mechanics and micromechanics. These proceedings include over 140 papers from the conference including case studies showing applications of plasticity in inter-disciplinary or nonconventional areas.

The Annual ESAFORM (European Scientific Association for Material Forming) conference brings together scientists and engineers working on all material forming processes with all types of materials. Volume is indexed by Thomson Reuters CPCI-S (WoS). The topics cover range from fundamental aspects and modelling, to practical engineering applications. This proceeding contains selected, peer reviewed papers from the 17th Conference of the European Scientific Association on Material Forming, ESAFORM 2014, May 7-9, 2014, Espoo, Finland

Within the rapidly growing field of hot sheet metal forming and metal bulk forming the demand arises for fully three-dimensionally tailored properties at the microstructural level, nevertheless, reaching a predefined geometry with such tailored properties puts high requirements on the control mechanisms utilized in the process chain for combined heating, metal forming, and cooling processes. Therefore, the underlying control architecture needs to be freely configurable with respect to a predefined database being extendible to new geometries, microstructural distributions, and materials. The combined control of locally and temporally differential thermo-mechanical effects during the process flow needs to be based on an adaptive algorithm adjusting the process flow in real-time according to predefined parameters delivered by the aforementioned material, geometry, and microstructure property database. The interplay between measurement techniques and adaptive control processes for hot metal forming of functionally graded materials is to be investigated in order to achieve the predefined fully three-dimensional microstructure in complex geometries and optimize the process cycle time in a freely configurable control architecture being customizable to new requirements and materials, resulting in a precision manufacturing process. The emphasis within the given thesis will be on adaptive control strategies embedded within a flexible control architecture for an innovative thermo-mechanical production process embracing induction heating to predefined spatial and temporal temperature distributions, transfer, and combined metal forming as well as heat extraction processes. The flexible control architecture assures an invariant quality for the highly dynamic processes and, moreover, yields extendibility to new materials, geometries, and microstructural distributions.

The physical modelling of metal forming processes has been widely used both in University and in Industry for many years. Relatively simple numerical models, such as the Slab Method and the Upper Bound Method, were first used and many such models are implemented in the industry for practical design or regulation of forming processes. These are also under investigation in the University, mainly for treat models ments which require low cost calculations or very fast answers for on-line integration. More recently, sophisticated numerical methods have been used for the simulation of metal flow during forming operations. Since the early works in 1973 and 1974, mainly in U. K. and U. S. A. , the applications of the finite element method to metal processing have been developed in many laboratories all over the world. Now the numerical approach seems to be widely re cognized as a powerful tool for comprehension oriented studies, for predic ting the main technological parameters, and for the design and the optlmi zation of new forming sequences. There is also a very recent trend for the introduction of physical laws in the thermo-mechanical models, in order to predict the local evolution of internal variable representing the micro structure of the metal. To day more and more practicians of the Industry are asking for compu ter models for design of their forming processes.

This book is devoted to the deformation and failure in metallic materials, summarizing the results of a research programme financed by the "Deutsche Forschungsgemeinschaft". It presents the recent engineering as well as mathematical key aspects of this field for a broad community. Its main focus is on the constitutive behaviour as well as the damage and fracture of metallic materials, covering their mathematical foundation, modelling and numerics, but also relevant experiments and their verification.

The numerical simulation of sheet metal forming processes has become an indispensable tool for the design of components and their forming processes. This role was attained due to the huge impact in reducing time to market and the cost of developing new components in industries ranging from automotive to packing, as well as enabling an improved understanding of the deformation mechanisms and their interaction with process parameters. Despite being a consolidated tool, its potential for application continues to be discovered with the continuous need to simulate more complex processes, including the integration of the various processes involved in the production of a sheet metal component and the analysis of in-service behavior. The quest for more robust and sustainable processes has also changed its deterministic character into stochastic to be able to consider the scatter in mechanical properties induced by previous manufacturing processes. Faced with these challenges, this Special Issue presents scientific advances in the development of numerical tools that improve the prediction results for conventional forming process, enable the development of new forming processes, or contribute to the integration of several manufacturing processes, highlighting the growing multidisciplinary characteristic of this field.

AI!, in the earlier conferences (Tokyo, 1986; Atlanta, 1988, Melbourne, 1991; and Hong Kong, 1992) the response to the call for presentations at ICES-95 in Hawaii has been overwhelming. A very careful screening of the extended abstracts resulted in about 500 paper being accepted for presentation. Out of these, written versions of about 480 papers reached the conference secretariat in Atlanta in time for inclusion in these proceedings. The topics covered at ICES-95 range over the broadest spectrum of computational engineering science. The editors thank the international scientific committee, for their advice and encouragement in making ICES-95 a successful scientific event. Special thanks are expressed to the International Association for Boundary Elements Methods for hosting IABEM-95 in conjunction with ICES-95. The editors here express their deepest gratitude to Ms. Stacy Morgan for her careful handling of a myriad of details of ICES-95, often times under severe time constraints. The editors hope that the readers of this proceedings will find a kaleidoscopic view of computational engineering in the year 1995, as practiced in various parts of the world. Satya N. Atluri Atlanta, Georgia, USA Genki Yagawa Tokyo,Japan Thomas A. Cruse Nashville, TN, USA Organizing Committee Professor Genki Yagawa, University of Tokyo, Japan, Chair Professor Satya Atluri, Georgia Institute of Technology, U.S.A.

This collection of papers focus on advanced methods for predicting and avoiding the occurrence of defects in manufactured products. A new feature is included, namely, the influence of the processing-induced defects on the integrity of structures. The following topics are developed: damage modeling; damage evaluation and rupture; strain localization and instability analysis; formability characterization; prediction of shape inaccuracies; influence of defects on structural integrity. The main manufacturing operations are covered and various materials are examined, such as new and conventional metal alloys, ceramics, polymers and composites.

An important collection of review papers by internationally recognized experts on the broad area of the mechanics of solids.

This work addresses the analysis of a sequential chain of processing steps, which is particularly important for the manufacture of robust product components. In each processing step, the material properties may have changed and distributions of related characteristics, for example, strains, may become inhomogeneous. For this reason, the history of the process including design-parameter uncertainties becomes relevant for subsequent processing steps. Therefore, we have developed a methodology, called PRO-CHAIN, which enables an efficient analysis, quantification, and propagation of uncertainties for complex process chains locally on the entire mesh. This innovative methodology has the objective to improve the overall forecast quality, specifically, in local regions of interest, while minimizing the computational effort of subsequent analysis steps. We have demonstrated the benefits and efficiency of the methodology proposed by means of real applications from the automotive industry.

The nature and the human creations are full of complex phenomena, which sometimes can be observed but rarely follow our hypotheses. The best we can do is to build a parametric model and then try to adjust the unknown parameters based on the available observations. This topic, called parameter identification, is discussed in this book for materials and structures. The present volume of lecture notes follows a very successful advanced school, which we had the honor to coordinate in Udine, October 6-10, 2003. The authors of this volume present a wide spectrum of theories, methods and applications related to inverse and parameter identification problems. We thank the invited lecturers and the authors of this book for their contributions, the participants of the course for their active participation and the interesting discussions as well as the people of CISMfor their hospitality and their well-known professional help. Zenon Mroz Georgios E. Stavroulakis CONTENTS Preface An overview of enhanced modal identification by L. Bolognini 1 The reciprocity gap functional for identifying defects and cracks by H. D. Bui, A. Constantinescu and H. Maigre 17 Some innovative industrial prospects centered on inverse analyses by G. Maier, M. Bocciarelli andR. Fedele 55 Identification of damage in beam and plate structures using parameter dependent modal changes and thermographic methods by Z. Mroz andK. Dems 95 Crack and flaw identification in statics and dynamics, using filter algorithms and soft computing by G. E, Stavroulakis, M. Engelhardt andH.

These are the proceedings of the International Conference on Design, Fabrication and Economy of Metal Structures held on 24-26 April 2013 in Miskolc, Hungary which contain 99 papers covering: Structural optimization Thin-walled structures Stability Fatigue Frames Fire Fabrication Welding technology Applications Steel-concrete composite Special problems The authors are from 23 different countries, ensuring that the themes covered are of worldwide interest and importance. The International Institute of Welding (IIW), the International Society of Structural and Multidisciplinary Optimization (ISSMO), the TÁMOP 4.2.1.B-10/2/KONV-2010-0001 project entitled “Increasing the quality of higher education through the development of research - development and innovation program at the University of Miskolc supported by the European Union, co-financed by the European Social Fund” and many other sponsors helped organizers to collect these valuable studies, the results of which will provoke discussion, and provide an important reference for civil and mechanical engineers, architects, researchers and structural designers and fabricators, as well as managers in a range of industries including building, transport, shipbuilding, aircraft, chemical and offshore engineering.

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The aim of this book is to summarize the current most effective methods for modeling, simulating, and optimizing metal forming processes, and to present the main features of new, innovative methods currently being developed which will no doubt be the industrial tools of tomorrow. It discusses damage (or defect) prediction in virtual metal forming, using advanced multiphysical and multiscale fully coupled constitutive equations. Theoretical formulation, numerical aspects as well as application to various sheet and bulk metal forming are presented in detail. Virtual metal forming is nowadays inescapable when looking to optimize numerically various metal forming processes in order to design advanced mechanical components. To do this, highly predictive constitutive equations accounting for the full coupling between various physical phenomena at various scales under large deformation including the ductile damage occurrence are required. In addition, fully 3D adaptive numerical methods related to time and space discretization are required in order to solve accurately the associated initial and boundary value problems. This book focuses on these two main and complementary aspects with application to a wide range of metal forming and machining processes. Contents 1. Elements of Continuum Mechanics and Thermodynamics. 2. Thermomechanically-Consistent Modeling of the Metals Behavior with Ductile Damage. 3. Numerical Methods for Solving Metal Forming Problems. 4. Application to Virtual Metal Forming.

This book gives a unified presentation of the research performed in the field of multiscale modelling in sheet metal forming over the course of more than thirty years by the members of six teams from internationally acclaimed universities. The first chapter is devoted to the presentation of some recent phenomenological yield criteria (BBC 2005 and BBC 2008) developed at the CERTETA center from the Technical University of Cluj-Napoca. An overview on the crystallographic texture and plastic anisotropy is presented in Chapter 2. Chapter 3 is dedicated to multiscale modelling of plastic anisotropy. The authors describe a new hierarchical multi-scale framework that allows taking into account the evolution of plastic anisotropy during sheet forming processes. Chapter 4 is focused on modelling the evolution of voids in porous metals with applications to forming limit curves and ductile fracture. The chapter details the steps needed for the development of dissipation functions and Gurson-type models for non-quadratic anisotropic plasticity criteria like BBC 2005 and those based on linear transformations. Chapter 5 describes advanced models for the prediction of forming limit curves developed by the authors. Chapter 6 is devoted to anisotropic damage in elasto-plastic materials with structural defects. Finally, Chapter 7 deals with modelling of the Portevin-Le Chatelier (PLC) effect. This volume contains contributions from leading researchers from the Technical University of Cluj-Napoca, Romania, the Catholic University of Leuven, Belgium, Clausthal University of Technology, Germany, Amirkabir University of Technology, Iran, the University of Bucharest, Romania, and the Institute of Mathematics of the Romanian Academy, Romania. It will prove useful to postgraduate students, researchers and engineers who are interested in the mechanical modeling and numerical simulation of sheet metal forming processes.

The principal aim of this text is to encourage the development and application of numerical modelling techniques as an aid to achieving greater efficiency and optimization of metal-forming processes. The contents of this book have therefore been carefully planned to provide both an introduction to the fundamental theory of material deformation simulation, and also a comprehensive survey of the "state-of-the-art" of deformation modelling techniques and their application to specific and industrially relevant processes. To this end, leading international figures in the field of material deformation research have been invited to contribute chapters on subjects on which they are acknowledged experts. The information in this book has been arranged in four parts: Part I deals with plasticity theory, Part II with various numerical modelling techniques, Part III with specific process applications and material phenomena and Part IV with integrated computer systems. The objective of Part I is to establish the underlying theory of material deformation on which the following chapters can build. It begins with a chapter which reviews the basic theories of classical plasticity and describes their analytical representations. The second chapter moves on to look at the theory of deforming materials and shows how these expressions may be used in numerical techniques. The last two chapters of Part I provide a review of isotropic plasticity and anisotropic plasticity.

The concept of virtual manufacturing has been developed in order to increase the industrial performances, being one of the most ef cient ways of reducing the m- ufacturing times and improving the quality of the products. Numerical simulation of metal forming processes, as a component of the virtual manufacturing process, has a very important contribution to the reduction of the lead time. The nite element method is currently the most widely used numerical procedure for s- ulating sheet metal forming processes. The accuracy of the simulation programs used in industry is in uenced by the constitutive models and the forming limit curves models incorporated in their structure. From the above discussion, we can distinguish a very strong connection between virtual manufacturing as a general concept, ?nite element method as a numerical analysis instrument and constitutive laws,aswellas forming limit curves as a speci city of the sheet metal forming processes. Consequently, the material modeling is strategic when models of reality have to be built. The book gives a synthetic presentation of the research performed in the eld of sheet metal forming simulation during more than 20 years by the members of three international teams: the Research Centre on Sheet Metal Forming—CERTETA (Technical University of Cluj-Napoca, Romania); AutoForm Company from Zürich, Switzerland and VOLVO automotive company from Sweden. The rst chapter presents an overview of different Finite Element (FE) formu- tions used for sheet metal forming simulation, now and in the past.

This international conference was held to provide a forum where recent advances and future directions in the numerical simulations of 3D Sheet Metal Forming Processes were discussed by engineers and scientists from industry and academia worldwide. The topics covered in the conference should be of great interest not only to numerical analysts but also to professionals and researchers involved in traditional and novel manufacturing technologies for conventional and emerging materials.