

Chapter 2 Hot Stamping Technology And The Main Equipment

Providing a comprehensive overview of hot stamping (also known as 'press hardening'), this book examines all essential aspects of this innovative metal forming method, and explores its various uses. It investigates hot stamping from both technological and business perspectives, and outlines potential future developments. Individual chapters explore topics such as the history of hot stamping, the state of the art, materials and processes employed, and how hot stamping is currently being used in the automotive industry to create ultra-high-strength steel components. Drawing on experience and expertise gathered from academia and industry worldwide, the book offers an accessible resource for a broad readership including students, researchers, vehicle manufacturers and metal forming companies.

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.

Advances in Machine Learning Research and Application / 2012 Edition is a ScholarlyEditions™

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eBook that delivers timely, authoritative, and comprehensive information about Machine Learning. The editors have built Advances in Machine Learning Research and Application / 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Machine Learning in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in Machine Learning Research and Application / 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>. Collection of selected, peer reviewed papers from the 2013 International Conference on Information Engineering for Mechanics and Materials (ICIMM 2013), July 5-7, 2013, Hangzhou, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 58 papers are grouped as follows: Chapter 1: Material Science and Technologies; Chapter 2: Research and Designing in Mechanical Engineering; Chapter 3: Control and Intelligent Automation; Chapter 4: Applied Computational Procedures and

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Information Technologies; Chapter 5: Related Topics.

Sustainable development is a globally recognized mandate and it includes green or environment-friendly manufacturing practices. Such practices orchestrate with the self-healing and self-replenishing capability of natural ecosystems. Green manufacturing encompasses synthesis, processing, fabrication, and process optimization, but also testing, performance evaluation and reliability. The book shall serve as a comprehensive and authoritative resource on sustainable manufacturing of ceramics, metals and their composites. It is designed to capture the diversity and unity of methods and approaches to materials processing, manufacturing, testing and evaluation across disciplines and length scales. Each chapter incorporates in-depth technical information without compromising the delicate link between factual data and fundamental concepts or between theory and practice. Green and sustainable materials processing and manufacturing is designed as a key enabler of sustainable development. A one-stop compendium of new research and technology of green manufacturing of metals, ceramics and their composites In-depth cutting-edge treatment of synthesis, processing, fabrication, process optimization, testing, performance evaluation and reliability which are of critical importance to green

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manufacturing Stimulates fresh thinking and exchange of ideas and information on approaches to green materials processing across disciplines

This third edition has been written to thoroughly update the coverage of injection molding in the World of Plastics. There have been changes, including extensive additions, to over 50% of the content of the second edition. Many examples are provided of processing different plastics and relating the results to critical factors, which range from product design to meeting performance

requirements to reducing costs to zero-defect targets. Changes have not been made that concern what is basic to injection molding. However, more basic information has been added concerning present and future developments, resulting in the book being more useful for a long time to come.

Detailed explanations and interpretation of individual subjects (more than 1500) are provided, using a total of 914 figures and 209 tables. Throughout the book there is extensive information on problems and solutions as well as extensive cross referencing on its many different subjects. This book represents the ENCYCLOPEDIA on IM, as is evident from its extensive and detailed text that follows from its lengthy Table of CONTENTS and INDEX with over 5200 entries. The worldwide industry encompasses many hundreds of useful plastic-related computer programs. This book lists these programs (ranging

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from operational training to product design to molding to marketing) and explains them briefly, but no program or series of programs can provide the details obtained and the extent of information contained in this single sourcebook.

This document provides the comprehensive list of Chinese National Standards - Category: GB, GB/T Series of year 2018.

The last decades have seen remarkable advances in computer-aided design, engineering and manufacturing technologies, multi-variable simulation tools, medical imaging, biomimetic design, rapid prototyping, micro and nanomanufacturing methods and information management resources, all of which provide new horizons for the Biomedical Engineering fields and the Medical Device Industry. *Advanced Design and Manufacturing Technologies for Biomedical Devices* covers such topics in depth, with an applied perspective and providing several case studies that help to analyze and understand the key factors of the different stages linked to the development of a novel biomedical device, from the conceptual and design steps, to the prototyping and industrialization phases. Main research challenges and future potentials are also discussed, taking into account relevant social demands and a growing market already exceeding billions of dollars. In time, advanced biomedical devices will decisively change methods and results in the medical world, dramatically improving diagnoses and therapies for all kinds of pathologies. But if these biodevices are to fulfill present expectations,

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today's engineers need a thorough grounding in related simulation, design and manufacturing technologies, and collaboration between experts of different areas has to be promoted, as is also analyzed within this handbook. This collection of 356 peer-reviewed papers is devoted to the topics of casting, forming and machining, processing and joining technologies, evolution of material properties in manufacturing processes, engineering or degradation of surfaces in manufacturing processes, design and behavior of equipment and tools; all seen from the perspective of the latest advances made and their practical application.

This congress proceedings provides recent research on leading-edge manufacturing processes. The aim of this scientific congress is to work out diverse individual solutions of "production in the border area" and transferable methodological approaches. In addition, guest speakers with different backgrounds will give the congress participants food for thoughts, interpretations, views and suggestions. The manufacturing industry is currently undergoing a profound structural change, which on the one hand produces innovative solutions through the use of high-performance communication and information technology, and on the other hand is driven by new requirements for goods, especially in the mobility and energy sector. With the social discourse on how we should live and act primarily according to guidelines of sustainability, structural change is gaining increasing dynamic. It is essential to translate politically specified sustainability goals into socially accepted and marketable technical solutions. Production research is

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meeting this challenge and will make important contributions and provide innovative solutions from different perspectives.

Hot Stamping Advanced Manufacturing Technology of Lightweight Car BodySpringer

This proceedings brings together seventy seven selected papers presented at the 3rd International Conference on Advanced High Strength Steel and Press Hardening (ICHSU2016), which was held in Xi'An, China, during August 25–27, 2016. In this rapid growing market in advanced high strength steel and press hardening, in particular demand from automotive industry and sustainability community to develop light-weight materials for Body in white or BIW, has motivated us to organize ICHSU2016, soon after the successful conclusion of our ICHSU2015 last year to encourage experts all over the world to get together again to exchange note and ideas as how to move the R&D in press hardening technology forward in the new era. The purpose of holding ICHSU2016 is to satisfy the increasingly urgent requirement of reducing the weight of vehicle structures and increasing passenger safety. This conference arouses great interests and attentions from domestic and foreign researchers in hot stamping field, of the articles accepted, covering almost all the current topics of advanced high strength steel and press hardening technology, which includes materials & testing, modeling & simulation, process design, tribology & tools, equipment and product properties.

Printing on Polymers: Fundamentals and Applications is the first authoritative reference covering the most

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important developments in the field of printing on polymers, their composites, nanocomposites, and gels. The book examines the current state-of-the-art and new challenges in the formulation of inks, surface activation of polymer surfaces, and various methods of printing. The book equips engineers and materials scientists with the tools required to select the correct method, assess the quality of the result, reduce costs, and keep up-to-date with regulations and environmental concerns. Choosing the correct way of decorating a particular polymer is an important part of the production process. Although printing on polymeric substrates can have desired positive effects, there can be problems associated with various decorating techniques. Physical, chemical, and thermal interactions can cause problems, such as cracking, peeling, or dulling. Safety, environmental sustainability, and cost are also significant factors which need to be considered. With contributions from leading researchers from industry, academia, and private research institutions, this book serves as a one-stop reference for this field—from print ink manufacture to polymer surface modification and characterization; and from printing methods to applications and end-of-life issues. Enables engineers to select the correct decoration method for each material and application, assess print quality, and reduce costs Increases familiarity with the terminology, tests, processes, techniques, and regulations of printing on plastic, which reduces the risk of adverse reactions, such as cracking, peeling, or dulling of the print Addresses the issues of environmental impact and cost when printing on

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polymeric substrates Features contributions from leading researchers from industry, academia, and private research institutions

Handbook of Printing, Packaging and Lamination is dedicated to the Printing and Packaging Industry, especially the Flexible Packing and Printing Industry. In this book, the author has made an attempt to look into the details of Printing Methods, Lamination methods and Applications. The book throws light on the raw materials required for the same and the various processes involved. This might work as a reference book for those associated with The Packaging Industry. SPA technical Advisor's proprietor is the author of this book. The core content of this book is derived from the experience of the author of being a 'visiting faculty member' for the SIES School of Printing and Packaging at Navi Mumbai, India for over 4 years.

Proceedings of the FISITA 2012 World Automotive Congress are selected from nearly 2,000 papers submitted to the 34th FISITA World Automotive Congress, which is held by Society of Automotive Engineers of China (SAE-China) and the International Federation of Automotive Engineering Societies (FISITA). This proceedings focus on solutions for sustainable mobility in all areas of passenger car, truck and bus transportation. Volume 11: Advanced Vehicle Manufacturing Technology focuses on:

- Applications of Aluminum, Magnesium and Zink Alloys , Composites
- Advanced Body Manufacturing Technology
- Body Corrosion Protection Technology
- Welding, Joining and Fastening
- Casting Technology
- Stamping Technology
- Paints, Polymers and Coatings
- Exterior Body Panels
- Advanced Process Management

Above all researchers, professional engineers

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and graduates in fields of automotive engineering, mechanical engineering and electronic engineering will benefit from this book. SAE-China is a national academic organization composed of enterprises and professionals who focus on research, design and education in the fields of automotive and related industries. FISITA is the umbrella organization for the national automotive societies in 37 countries around the world. It was founded in Paris in 1948 with the purpose of bringing engineers from around the world together in a spirit of cooperation to share ideas and advance the technological development of the automobile.

This book summarizes the advanced manufacturing technology of original innovations in hot stamping of lightweight car body. A detailed description of the technical system and basic knowledge of sheet metal forming is given, which helps readers quickly understand the relevant knowledge in the field. Emphasis has been placed on the independently developed hot stamping process and equipment, which help describe the theoretical and experimental research on key problems involving stress field, thermal field and phase transformation field in hot stamping process. Also, a description of the formability at elevated temperature and the numerical simulation algorithms for high strength steel hot stamping is given in combination with the experiments. Finally, the book presents some application cases of hot stamping technology such as the lightweight car body design using hot stamping components and gradient hardness components, and the cooling design of the stamping tool. This book is intended for researchers, engineers and graduate students in vehicle engineering, mechanical engineering, especially in the field of advanced manufacturing technology. The book also provides a useful reference for other new technology related temperature and phase transformation, such as aluminum-magnesium alloy

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hot stamping.

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.

Mechanics of Materials in Modern Manufacturing Methods and Processing Techniques provides a detailed overview of the latest developments in the mechanics of modern metal forming manufacturing. Focused on mechanics as opposed to process, it looks at the mechanical behavior of materials exposed to loading and environmental conditions related to

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modern manufacturing processes, covering deformation as well as damage and fracture processes. The book progresses from forming to machining and surface-treatment processes, and concludes with a series of chapters looking at recent and emerging technologies. Other topics covered include simulations in autofrettage processes, modeling strategies related to cutting simulations, residual stress caused by high thermomechanical gradients and pultrusion, as well as the mechanics of the curing process, forging, and cold spraying, among others. Some non-metallic materials, such as ceramics and composites, are covered as well. Synthesizes the latest research in the mechanics of modern metal forming processes Suggests theoretical models and numerical codes to predict mechanical responses Covers mechanics of shot peening, pultrusion, hydroforming, magnetic pulse forming Considers applicability of different materials and processes for optimum performance

Collection of selected, peer reviewed papers from the 1st International Conference on Hot Stamping of UHSS (ICHSU 2014), August 21-24, 2014, Chongqing, China. The 66 papers are grouped as follows: Chapter 1: Material Technologies and Testing; Chapter 2: Forming and Stamping Technologies and Investigations; Chapter 3: Modeling, Simulation and Calculation Methods; Chapter 4: Equipments and Its Application

This proceedings brings together one hundred and ten selected papers presented at the 2nd International Conference on Advanced High Strength Steel and Press Hardening (ICHSU2015), which was held in Changsha, China, during October 15–18, 2015. To satisfy the increasingly urgent requirement of reducing the weight of vehicle structures and increasing passenger safety, ICHSU2015 provided an excellent international platform for researchers to share their knowledge and results in theory,

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methodology and applications of advanced high strength steel and press hardening technology. This conference aroused great interests and attentions from domestic and foreign researchers in hot stamping field. Experts in this field from Australia, China, Germany and Sweden, contributed to the collection of research results and developments. The papers cover almost all the current topics of advanced high strength steel and press hardening technology.

Contents:Materials & Testing I:Recent Developments and Challenges in Hot Stamping of Boron Steel (J P Lin, F F Li and J Y Min)Research on Grain Growth Behavior of Boron Steel (L F Song, M T Ma and G Fang)The Evolution of Oxidation Scales on 22MnB5 Hot Press Forming Steel during Rapid Heating (S J Yao, W J Liu, W B Gao, Z W Zhang and Y L Ding)Resistance Spot Welding Test of 1300HF Hot Forming Steel (Y H Hu, Z J Huang, R Ge and J G Hu)The Development of Data Processing Software for Dynamic Tension of Materials (Y Zhao, M T Ma, X M Wan, Q S Jin, J P Zhang and G Fang)Materials & Testing II:Microstructure and Mechanical Properties of Fe-18Mn-10Al-1.2C Steel (D Han, H Ding, Z H Cai, Z Q Wu and J Zhang)Research on Stamping Performace of Dual Phase Steel in Tailor Welded Blanks (G C Liu, F Li, H C Zhu, C Wang, F X Xu and G Wang)Effect of Strain Path on the Dynamic Mechanical Properties of DP780 (Q J Zhao, G Fang, J P Zhang and Q S Jin)Mechanical Properties and Microstructure of DP Steel Sheets under Dynamic Loads (J P Zhang, G Fang, Q S Jin and M T Ma)Magnetic Barkhausen Noise Signal Characteristics of TRIP800 under Uniaxial Tension (Y Xu, B Zhu, Y L Wang, Y S Zhang and W Zhang)Modeling & Simulation:Metallo-Thermo-Mechanical Coupled Analysis of the Influence of Key Process Parameters on the Quality of Hot Stamping Component (W Zhang, Y G Liu, H R Gu, J C Jin, Y Zhang, J W Li and H B Wang)Finite Element Simulation

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for Hot Stamping of Automobile Pillar Inner Panel (F X Jin, Z Shen, Y Bian and Z P Zhong) Numerical Simulation on Cooling System of Hot Stamping Mold In B-Pillar (G J Chen, Y Zhang, W Shen, L J Qin, N Deng and X C Yao) Study on the Deflection Mechanism in Radial Ring Rolling (W X Hao, L H Song and C F Wang) Process Design: Tendency of Heat Treatment of Large Workpieces: Novel ATQ Technology (X W Zuo, N L Chen and Y H Rong) Research on High Strength Steel Hot Stamping Technology and Equipment (Y L Wang, B Zhu and Y S Zhang) Experiment and Simulation of Hot Stamping Tailor-Welded High Strength Steels (B T Tang, W Zheng and L L Huang) Development of Side Frame Beam with Hot Stamping Process (Q Yang, B Liu and Z T Zhu) Controlling Spring Back of High-Strength Steel Based on Shape Adjustable Bead (C Y Wang, X Y Zhang, C Dai, S Y Wang and F F Guo) Tribology & Tools: Tribology in Hot Stamping of Boron Steel Sheets (S Bruchi, A Ghiotti and F Medea) Understanding Wear Conditions during Hot Stamping (M P Pereira, A Abdollahpoor, B F Rolfe, P Zhang and C Wang) The Influence of Re Flow Ionitriding on Abrasion Resistance of H13 Mould Material (M T Ma, Z F Sun, X C Yao, W Shen and L F Song) Equipment: Advanced Design of Continuous Furnace for Hot Stamping Line (B Dvorak, J J Tawk and T Vit) New Trends of Laser Applications for Hot Forming Parts Manufacturing (J H Ji and P Wang) Robot-Based Automatic Dimension Inspection for Hot Stamping Parts (L Y Han, Z W Li, K Zhong, G M Zhan, Y J Huang, G Yang and M Zhou) Product Properties: The Application of Press Hardened Steel on Volvo XC90 Gen II (X M Wan, Y Zhao, Y Li and J Zhou) Optimization Design of Side Collision Performance in Whole Car Based on Advanced Hot Stamping The Exploring Research of A-Pillar Strength Tube Based on the Vehicle's Small Overlap Crashworthiness (B H Wang, T Q Fan, F Wang, Q J Zhao and Y Li) Performance

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Evaluation of Hot Pressed Front Bumper (J P Zhang, L F Song, G Y Wang, M T Ma)The Cold Bending Cracking Analysis of Hot Stamping Door Bumper (M T Ma, Y Zhao, H Z Lu, J Bian, A M Guo and Z F Dun)and other papers
Readership: Researchers and Professionals in Advanced High Strength Steel and Press Hardening. Key Features:The proceedings collected together the latest late-breaking contributions funded by Chinese government research agencies in Material Science and Application, Mechanical EngineeringPrinted version of about 30 copies will be POD to meet the order form conference participants and authors alikeAdditional copies will be printed for marketing to include in their library package

The automotive industry requirements for vehicle weight reduction, weight containment, improved part functionality and passenger safety have resulted in the increased use of steel grades with a fully martensitic microstructure. These steel grades are essential to improve the anti-intrusion resistance of automotive body parts and the related passenger safety during car collisions. Standard advanced high strength steel (AHSS) grades are notoriously difficult to be formed by cold stamping; they are characterized by elastic springback, poor stretch flangeability and low hole expansion ratios. Hot stamping has therefore received much attention recently as an alternative technology to produce AHSS automotive parts.In this book, selected articles from the Fourth International Conference on Advanced High Strength Steel and Press Hardening held on August 20-22th, 2018 in Hefei, China, are compiled. It focuses on AHSS for the development of press hardening of high performance sheet metal for lightweight vehicle, advanced digital manufacturing technology, as well as the physical metallurgy principles of the hot stamping process.Aiming at the process design and industrial application for hot stamping of press hardened steel

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and high strength aluminium alloy sheet, the effect of temperature and strain rate on the formability and mechanical properties of the products is discussed. In addition, more practical cases are provided concerning accurate modelling and multi-physics coupling simulation of the hot stamping process. Furthermore, the influence of tool design on forming process, more precise process control strategies to increase production efficiency, and the improvement of hot stamping equipment by advanced design methods will also be presented.

Collection of selected, peer reviewed papers from 2013 the 2nd International Conference on Mechanical Design and Power Engineering (ICMDPE 2013), November 29-30, 2013, Beijing, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 330 papers are grouped as follows: Chapter 1: Advanced Materials Engineering, Technologies and Processing; Chapter 2: Applied Mechanics and Dynamics; Chapter 3: Engineering Design, Modeling, Simulation and Computational Methods; Chapter 4: Engineering and Automation; Chapter 5: Electronics and Integrated Circuits, Embedded Technology and Applications; Chapter 6: Electrical Engineering, Electric Machines and Mechatronics; Chapter 7: Data and Signal Processing; Chapter 8: Measurement, Monitoring and Testing Technologies

The focus of the Congress will be leading-edge manufacturing processes. Topics include manufacturing at extreme speed, size, accuracy,

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methodology, use of resources, interdisciplinarity and more. Contributions from production and industrial engineering are welcome. Challenges from the areas of manufacturing, machines and production systems will be addressed. Production research constantly pushes the boundaries of what is feasible. The Congress "Production at the leading edge of technology" will highlight production processes that are advancing into areas that until recently were considered unfeasible, also in terms of methodology, use of resources and interdisciplinarity. But where does the search for new limits lead? Which limitations do we still have to overcome, which ones do we not want to overcome? The aim of the German-speaking colloquium is to establish connections between the research locations and to intensify the overall transfer of results and experience with industrial users.

The main objective of the book is to expose readers to the basics of sustainable material forming and joining technologies, and to discuss the relationship between conventional and sustainable processes. It also provides case studies for sustainable issues in material forming and joining processes, workouts for converting conventional processes to green processes, and highlights the importance of awareness on sustainable and green manufacturing through education. The book will include green and sustainability concepts in material forming like bulk

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forming and sheet forming emphasizing hot forming, materials development, lubrication, and minimizing defects. Key Features Conceptualizes green and sustainability issues towards efficient material forming and joining Addresses important aspects of sustainable manufacturing by forming operations Presents comparison between traditional and sustainable manufacturing processes Includes practical case studies from industry experts Discusses green and sustainability concepts in material forming like bulk forming and sheet forming emphasizing hot forming, materials development, lubrication, and minimizing defects

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

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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 document provides the comprehensive list of Chinese National Standards - Category: GB; GB/T, GBT.

Current research fields in science and technology were presented and discussed at the EKC2008, informing about the interests and directions of the scientists and engineers in EU countries and Korea. The Conference has emerged from the idea of bringing together EU and Korea to get to know each other better, especially in fields of science and technology. The focus of the conference is put on the topics: Computational Fluid Dynamics; Mechatronics and Mechanical Engineering; Information and Communications Technology; Life and Natural Sciences; Energy and Environmental Technology.

The plastics industry is a major player for consumer items, notably for the automotive, consumer electronics and packaging industries, and is

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necessarily very active in innovation. As a result, moulded thermoplastics are achieving new heights in decorative appearance and quality. Many striking aesthetic effects are possible by employing new polymer blends coupled with a diverse range of decoration and surface treatment technologies. These can produce three-dimensional and tactile finishes, high definition images, flawless high gloss and metallic surfaces, as well as effects ranging from imitation materials, interferential colours, colour gradients, colour change and travel, gloss and matte combinations, and even acoustic or olfactory effects. Manufacturing processes to achieve these include several types of in-mould film, coating or decorating technique, relatively recent technologies to improve surface quality, as well as traditional separate decorating or coating processes such as dry offset; flexographic; inkjet; pad and screen printing; foil transfer; labelling; laser marking; plating; spray coating; and vacuum deposition. This unique book analyses and compares recent trends in each of over 20 types of mainstream manufacturing process and 10 classes of sensory effect they can produce. Supported by over 100 tables, a 3-year sampling of over 1,000 mentioned patent documents and hundreds of commercial developments helps to identify the main trends and their innovators, key innovative clusters and the most sought-after effects, as well as provide indications for the future.

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This volume focuses on the practical application of processes for manufacturing plastic products. It includes information on design for manufacturability (DFM), material selection, process selection, dies, molds, and tooling, extrusion, injection molding, blow molding, thermoforming, lamination, rotational molding, casting, foam processing, compression and transfer molding, fiber reinforced processing, assembly and fabrication, quality, plant engineering and maintenance, management.

The papers collected in this special issue clearly reflect the modern research trends in materials science. These fields of specific attention are high-Mn TWIP steels, high-Cr heat resistant steels, aluminum alloys, ultrafine grained materials including those developed by severe plastic deformation, and high-entropy alloys. The major portion of the collected papers is focused on the mechanisms of microstructure evolution and the mechanical properties of metallic materials subjected to various thermo-mechanical, deformation or heat treatments. Another large portion of the studies is aimed on the elaboration of alloying design of advanced steels and alloys. The changes in phase content, transformation and particle precipitation and their effect on the properties are also broadly presented in this collection, including the microstructure/property changes caused by irradiation.

"Completely updated and enlarged to reflect the advances that have taken place since the publication of the Second Edition. Third Edition offers concise examinations of the chemical nature, characteristic

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properties, and uses of traditional industrial polymers, such as acrylics, polyolefins, vinyl polymers, polyesters, epoxies, and silicones, among others."

Comprehensive Materials Processing provides students and professionals with a one-stop resource consolidating and enhancing the literature of the materials processing and manufacturing universe. It provides authoritative analysis of all processes, technologies, and techniques for converting industrial materials from a raw state into finished parts or products. Assisting scientists and engineers in the selection, design, and use of materials, whether in the lab or in industry, it matches the adaptive complexity of emergent materials and processing technologies. Extensive traditional article-level academic discussion of core theories and applications is supplemented by applied case studies and advanced multimedia features. Coverage encompasses the general categories of solidification, powder, deposition, and deformation processing, and includes discussion on plant and tool design, analysis and characterization of processing techniques, high-temperatures studies, and the influence of process scale on component characteristics and behavior. Authored and reviewed by world-class academic and industrial specialists in each subject field Practical tools such as integrated case studies, user-defined process schemata, and multimedia modeling and functionality Maximizes research efficiency by collating the most important and established information in one place with integrated applets linking to relevant outside sources

The aim of MSCE 2014 is to provide a platform for

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researchers, engineers, and academicians, as well as industrial professionals, to present their research results and development activities in mechanism science and control engineering. It provides opportunities for the delegates to exchange new ideas and application experiences, to establish business or research relations and to find global partners for future collaboration. MSCE2014 is conducted to all the researchers, engineers, industrial professionals and academicians, who are broadly welcomed to present their latest research results, academic developments or theory practice. Topics of interest include but are not limited to Mechanism theory and Application, Mechanical control and Automation Engineering, Mechanical Dynamics, Materials Processing and Control, Instruments and Vibration Control. It is of great pleasure to see the delegates exchanging ideas and establishing sound relationships on the conference.

This book focuses on the technology involved in using plastics, explaining the key areas of plastic materials, plastic product design, plastic processing, plastic end-use markets, and issues within the plastics industry, that are critical to working and communicating within the plastics industry.

This document provides the comprehensive list of Chinese National Standards and Industry Standards (Total 17,000 standards).

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