The Plastic Deformation Of Metals

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The Plastic Deformation Of Metals ***2021-06-08***

LARSEN DONNA

Plastic Deformation of Metals John Wiley & Sons
Discover a novel approach to the subject, providing detailed information about established and innovative mechanical testing procedures.
Severe Plastic Deformation and Thermomechanical Processing: Nanostructuring and Properties Elsevier
Contributions To The Metallurgy Of Steel, No. 42.
Theory of Metal Forming Plasticity Springer
Discover a novel, self-contained approach to an important technical area, providing both theoretical background and practical details. Coverage includes mechanics and physical metallurgy, as well as study of both established and novel procedures such as indentation plastometry. Numerical simulation (FEM modelling) is explored thoroughly, and issues of scale are discussed in depth. Discusses procedures designed to explore plasticity under various conditions, and relates sample responses to deformation mechanisms, including microstructural effects. Features references throughout to industrial processing and component usage conditions, to a wide range of metallic alloys, and to effects of residual stresses, anisotropy and inhomogeneity within samples. A perfect tool for materials scientists, engineers and researchers involved in mechanical testing (of metals), and those involved in the development of novel materials and components.
The Plastic Deformation of Metals Springer Science & Business Media
Material processing techniques that employ severe plastic deformation have evolved over the past decade, producing metals, alloys and composites having extraordinary properties. Variants of SPD methods are now capable of creating monolithic materials with submicron and nanocrystalline grain sizes. The resulting novel properties of these materials has led to a growing scientific and commercial interest in them. They offer the promise of bulk nanocrystalline materials for structural; applications, including nanocomposites of lightweight alloys with unprecedented strength. These materials may also enable the use of alternative metal shaping processes, such as high strain rate superplastic forming. Prospective applications for medical, automotive, aerospace and other industries are already under development.
Inelastic Deformation of Metals Cambridge University Press
Severe Plastic Deformation: Methods, Processing and Properties examines all severe plastic deformation techniques developed over the past two decades, exploring the appropriate severe plastic deformation method for a particular case. The book offers an overview of these methods, introduces ultrafine-grained and nano-grained metals and methods for various bulk, sheet, tubular and large size samples, reviews effective parameters to make a severe plastic deformation method better, from property (mechanical) and processing (cost, time, load, etc.) viewpoints, discusses mechanical, physical and chemical properties of UFG and NS metals, and concludes with various applications for these methods. Over the last several decades, a large number of severe plastic deformation methods have been developed for processing a wide array of metals for superior properties, making this a timely resource. Collects all severe plastic deformation methods in a unique reference Compares severe plastic deformation methods from several viewpoints, including processing and final property Classifies severe plastic deformation methods based on the sample shape and mechanics, as well as the properties achieved in the processed metal Introduces ultrafine-grained and nano-grained metals and methods for various bulk, sheet, tubular and large size samples
A Study of the Plastic Deformation of Metals by the Observation of Single Dislocations Trans Tech Publications Ltd
This book gives information on different building materials, atomic structure and bonding, crystallography, defects in crystals and plastic deformation, phase diagrams, thermally activated reactions and diffusion, fracture, fatigue and creep and hardness and tensile testing.
Mechanics of Plastic Deformation in Metal Processing Springer Science & Business Media
Severe plastic deformation (SPD) is a very attractive research field for metallic materials because it provides new possibilities for manufacturing nanostructured materials in large quantities and allows microstructural design on different hierarchical levels. The papers included in this issue address the following topics: novel SPD processes as well as recent advancements in established processing methods, microstructure evolution and grain refinement in single- and multi-phase alloys as well as composites, strategies to enhance the microstructure stability at elevated temperatures, mechanically driven phase transformations, surface nanostructuring, gradient and multilayered materials, and mechanical and physical properties of SPD-processed materials.
Plastic Deformation of Metals MDPI
Treatise on Materials Science and Technology, Volume 6: Plastic Deformation of Materials covers the fundamental properties and characterization of materials, ranging from simple solids to complex heterophase systems. The book presents articles on the low temperature of deformation of bcc metals and their solid-solution alloys; the cyclic deformation of metals and alloys; and the high-temperature diffusion-controlled creep of some metals and alloys, with particular reference to the various creep mechanisms. The text also includes articles on superplasticity; the fatigue deformation of polymers; the low temperature deformation of crystalline nonmetals; and the recovery and recrystallization during high temperature deformation. Professional scientists and engineers, as well as graduate students in materials science and associated fields will find the book invaluable.
Plastic Deformation and Strain Hardening Elsevier
This publication is based upon lectures given during a well-received course on physical metallurgy and originally intended for students specializing in fields related to metallic materials. But, as the author points out, metallic materials are the most widely investigated group of materials and their study therefore gives a good basis for understanding how other materials can be made to reveal interrelationships between their structures and properties; especially with regard to those properties associated with strain. Similar types of rule can then be applied to other materials, in spite of their apparent differences.
Fundamentals of the Plastic Deformation of Metals as Revealed by X-ray Diffraction Studies Cambridge University Press
The intention of this book is to reveal and discuss some aspects of the metal fo- ing plasticity theory. The modern theory describes deformation of metallic bodies in cold and hot regimes under combined thermal and mechanical loadings. Th- mal and deformation fields appear in metal forming in various forms. A thermal field influences the material properties, modifies the extent of plastic zones, etc. and the deformation of metallic body induces changes in temperature distribution. The thermal effects in metal forming plasticity can be studied at two levels, - pending on whether uncoupled or coupled theories of thermo-plastic response have to be applied. A majority of metal forming processes can be satisfactorily studied within an uncoupled theory. In such an approach the temperature enters the stress-strain relation through the material constants and through the thermal dilatation. The description of thermo-plastic deformation in metal forming is c- ried out on the ground of thermodynamics.
Plastic Deformation of Metals
Using a totally new approach, this groundbreaking book establishesthe logical connections between metallurgy, materials modeling, andnumerical applications. In recognition of the fact that classicalmethods are inadequate when time effects are present, or whencertain types of multiaxial loads are applied, the new, physicallybased state variable method has evolved to meet these needs.Inelastic Deformation of Metals is the first comprehensivepresentation of this new technology in book form. It developsphysically based, numerically efficient, and accurate methods forpredicting the inelastic response of metals under a variety ofloading and environmental conditions. More specifically, Inelastic Deformation of Metals: * Demonstrates how to use the metallurgical information to developmaterial models for structural simulations and low cyclic fatiguepredictions. It presents the key features of classical and statevariable modeling, describes the different types of models andtheir attributes, and provides methods for developing models forspecial situations. This book's innovative approach covers such newtopics as multiaxial loading, thermomechanical loading, and singlecrystal superalloys. * Provides comparisons between data and theory to help the readermake meaningful judgments about the value and accuracy of aparticular model and to instill an understanding of how metalsrespond in real service environments. * Analyzes the numerical methods associated with nonlinearconstitutive modeling, including time independent, time dependentnumerical procedures, time integration schemes, inversiontechniques, and sub-incrementing. Inelastic Deformation of Metals is designed to give theprofessional engineer and advanced student new and expandedknowledge of metals and modeling that will lead to more accuratejudgments and more efficient designs. In contrast to existing plasticity books, which discuss few if anycorrelations between data and models, this breakthrough volumeshows engineers and advanced students how materials and modelsactually do behave in real service environments. As greater demandsare placed on technology, the need for more meaningful judgmentsand more efficient designs increases dramatically. Incorporatingthe state variable approach, Inelastic Deformation of Metals: * Provides an overview of a wide variety of metal responsecharacteristics for rate dependent and rate independent loadingconditions * Shows the correlations between the mechanical response propertiesand the deformation mechanisms, and describes how to use thisinformation in constitutive modeling * Presents different modeling options and discusses the usefulnessand limitations of each modeling approach, with material parametersfor each model * Offers numerous examples of material response and correlationwith model predictions for many alloys * Shows how to implement nonlinear material models in stand-aloneconstitutive model codes and finite element codes An innovative, comprehensive, and essential book, InelasticDeformation of Metals will help practicing engineers and advancedstudents in mechanical, aerospace, civil, and metallurgicalengineering increase their professional skills in the moderntechnological environment.
Plastic Deformation of Metals
Severe Plastic Deformation
Testing of the Plastic Deformation of Metals
The Plastic Deformation of Metals Under Impact
The Influence of Point Defects on the Plastic Deformation of Metals
Plastic Deformation of Metals
Theoretical Studies of the Plastic Deformation of Metals
The Plastic Deformation Of Metals
Investigations and Applications of Severe Plastic Deformation