

Shape Memory Materials

K. Otsuka, C. M. Wayman

Shape Memory Materials:

Shape Memory Materials K. Otsuka, C. M. Wayman, 1999-10-07 A comprehensive account of shape memory materials now available in paperback Shape Memory Materials Arun D I, Chakravarthy P, Arockia Kumar R, Santhosh B, 2018-04-27 This work addresses the basic principles synthesis fabrication and applications of smart materials specifically shape memory materials Based on origin the mechanisms of transformations vary in different shape memory materials and are discussed in different chapters under titles of shape memory alloys ceramics gels and polymers Complete coverage of composite formation with polymer matrix and reinforcement filler conductive materials with examples **Additive Manufacturing of** Shape Memory Materials Mehrshad Mehrpouya, Mohammad Elahinia, 2024-10-23 Additive Manufacturing of Shape Memory Materials Techniques Characterization Modeling and Applications outlines an array of techniques and applications for additive manufacturing AM and the use of various shape memory materials covering corrosion properties material sensitivity to thermal magnetic and electrical effects as well as sensitivity of shape memory properties to AM parameters including part geometry effects and post process treatments Design for AM and a number of different AM methods are discussed with materials covered including shape memory alloys shape memory polymers high temperature shape memory alloys and magnetic shape memory alloys Characterization and modeling methods are also included as is a chapter dedicated to real world applications of these production techniques and materials Provides an overview of various shape memory materials their additive manufacturing techniques and processes their applications and opportunities and challenges related to their production and use Outlines the thermomechanical and functional properties of shape memory alloys that can be applied to their additive manufacturing processes Covers techniques for additive manufacturing of shape memory polymers shape memory alloys high temperature shape memory alloys and magnetic shape memory alloys Discusses characterization post processing modeling and applications of shape memory materials Advances in Shape Memory Materials, 2008

Advances in Shape Memory Materials Volodymyr A. Chernenko, 2008-05-15 Ferromagnetic Shape Memory Alloys Special topic volume with invited papers only Shape-Memory Materials Alicia Esther Ares, 2018-09-26 Shape memory materials are materials that react under variations of electric or magnetic fields physical or chemical changes and that when returning to the initial conditions recover their original form capable of repeating this process an infinite number of times without deteriorating The characteristics fabrication techniques and thermomechanical treatment of various shape memory materials are described in detail in this book The book describes several principles and applications Advances in Shape Memory Materials Qingping Sun, Ryosuke Matsui, Kohei Takeda, Elżbieta A. Pieczyska, 2017-03-14 This book is devoted to the development of the shape memory materials and their applications It covers many aspects of smart materials It also describes the method on how we can obtain not only large recovery strains but also high recovery stress energy storage and energy dissipation in applications This volume treats the mechanical properties of shape memory alloys shape memory

polymers and the constitutive equations of the materials which are necessary to design the shape memory elements in applications It also deals with the fatigue properties of materials the method to design the shape memory elements and the shape memory composites The authors are international experts on shape memory alloys and shape memory polymers in the metallurgical chemical mechanical and engineering fields The book will be of interest to graduate students engineers scientists and designers who are working in the field of electric and mechanical engineering industries medical engineering aerospace engineering robots automatic machines clothes and recycling for research design and manufacturing Memory Materials and their Applications Y.Y. Chu, Lian Cheng Zhao, 2002-05-11 SMM SMST 2001 International Conference on Shape Memory and Superelastic Technologies and Shape Memory Materials SMST SMM 2001 held in Kunming China 2 6 September 2001 Functional Properties of Shape Memory Materials and Their Applications Hisaaki Tobushi, Tadashige Ikeda, Kazuhiro Kitamura, Ryosuke Matsui, Kohei Takeda, 2021 This book is compiled into three parts Part 1 describes the functional properties of shape memory alloy such as the shape memory effect and superelasticity the constitutive equation for thermomechanical properties the bi axial tensile torsional behavior influence of strain rate on deformation behavior cyclic deformation properties micromechanical model of polycrystalline SMAs application of thermomechanical model to tension compression behavior the transformation induced creep and stress relaxation and the torsional deformation of thin tape Part 2 contains the advanced functions of shape memory alloy and polymer such as the shape retaining control using SMA system the micromechanical model of shape memory polymer performance of shape memory polymer composite enhancement of fatigue life of SMA by ultrasonic shot peening and nitrogen ion implantation enhancement of corrosion fatigue life of SMA development of functionally graded shape memory alloy and polymer development of shape memory composites and development of 3D printing of shape memory polymer Part 3 deals with the applications of shape memory alloy and polymer such as the development of application model in engineering filed the smart vortex generator for aircraft the smart morphing flap driven by SMA wires and the development of application models of SMA brain spatula in medical engineering filed the working support device in nursing care field and the energy conversion teaching material in education This book will be interested to graduate students engineers materials scientists and designers who are working in the field of mechanical and electric engineering medical engineering nursing care technology aerospace engineering robots automatic machines clothes and recycling for research design manufacturing and fabrication Shape Memory Materials '94 Youyi Chu, Hailing Tu, 1994

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