



Intelligent Materials and Structures /

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Materials Science; Physics; Science

Monografía

This book provides insight into designing intelligent materials and structures for special application in engineering. The book discusses simulation and experimental determination of physical material properties, such as piezoelectric effects, shape memory, electro-rheology, and distributed control for vibrations minimization

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Nota general: 5.2 Modeling ER and MR Fluids

Contenido: Preface ; Contents ; 1 Introduction to Intelligent Materials and Structures ; 1.1 Types of Intelligent Materials ; 1.2 Extended Review on Piezoelectric Materials, SMA, ER and MR Fluids and MS and ES Materials ; 1.2.1 Extended Review on Piezoelectricity 1.2.2 Extended Review on Shape Memory Alloys 1.2.3 Extended Review on Electrorheological and Magnetorheological Fluids ; 1.2.4 Extended Review on Magnetostrictive and Electrostrictive Materials ; 1.3 Typical Properties of Intelligent Materials 1.4 Recent Applications of Intelligent Materials and Systems 2 Laminated Composite Materials ; 2.1 Classical Lamination Theory ; 2.2 First-Order Shear Deformation Theory (FSDT) Model ; 3 Piezoelectricity ; 3.1 Constitutive Equations ; 3.2 Pin Force Beam Model 3.3 Uniform-Strain Beam Model 3.4 Bernoulli-Euler Beam Model ; 3.5 First-Order Shear Deformation (Timoshenko Type) Beam Model ; 3.6 Composite Plates with Piezoelectric Patches ; 3.7 Appendix I ; 3.7.1 Appendix A ; 3.7.2 Appendix B: Constants Presented in Table 3.4 3.7.3 Appendix C: Constants Presented in Table 3.5 3.7.4 Appendix D ; 4 Shape Memory Alloys ; 4.1 Basic Behavior of SMA ; 4.2 Constitutive Equations ; 4.3 SMA Models in Literature ; 5 Electrorheological and Magnetorheological Fluids ; 5.1 Fundamental Behavior of ER and MR Fluids

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