1. Record Nr. UNINA9910734865003321 Autore Follansbee Paul Titolo Fundamentals of strength: principles, experiments, and applications of an internal state variable constitutive formulation / / Paul Follansbee Cham, Switzerland: ,: Springer International Publishing, , [2022] Pubbl/distr/stampa ©2022 **ISBN** 9783031045561 9783031045554 Edizione [2nd edition.] Descrizione fisica 1 online resource (546 pages) The Minerals, Metals and Materials Series. Collana Disciplina 620.112 Soggetti Strength of materials - Mathematical models Strains and stresses Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di contenuto Intro -- Foreword to the Second Edition -- Preface to the First Edition -- Preface to the Second Edition -- Acknowledgment -- How to Use This Textbook -- Contents -- About the Author -- Symbols -- Chapter 1: Measuring the Strength of Metals -- 1.1 How Is Strength Measured? -- 1.2 The Tensile Test -- 1.3 Stress in a Test Specimen -- 1.4 Strain in a Test Specimen -- 1.5 The Elastic Stress Versus Strain Curve -- 1.6 The Elastic Modulus -- 1.7 Lateral Strains and Poisson's Ratio -- 1.8 Defining Strength -- 1.9 Stress-Strain Curve -- 1.10 The True Stress-True Strain Conversion -- 1.11 Example Tension Tests -- 1.12 Accounting for Strain Measurement Errors -- 1.13 Formation of a Neck

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Sommario/riassunto

This second edition updates and expands on the class-tested first edition text, augmenting discussion of dynamic strain aging and austenitic stainless steels and adding a section on analysis of nickel-base superalloys that shows how the mechanical threshold stress (MTS) model, an internal state variable constitutive formulation, can be used to de-convolute synergistic effects. The new edition retains a clear and rigorous presentation of the theory, mechanistic basis, and application of the MTS model.