1. Record Nr.   UNINA9910299710203321

   Titolo   Constitutive relations under impact loadings : experiments, theoretical and numerical aspects / / Tomasz Lodygowski, Alexis Rusinek, editors

   Pubbl/distr/stampa   Wien [Vienna] : , : Springer, , 2014

   ISBN   3-7091-1768-2

   Edizione   [1st ed. 2014.]

   Descrizione fisica   1 online resource (285 pages) : illustrations (some color)

   Collana   CISM International Centre for Mechanical Sciences, Courses and Lectures, , 0254-1971 ; ; 552

   Disciplina   515
                                  515/.35
                                  620.1125

   Soggetti   Materials - Mechanical properties
                                  Impact

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Note generali   "ISSN: 0254-1971."

   Nota di bibliografia   Includes bibliographical references at the end of each chapters.

   Nota di contenuto   Testing with bars from dynamic to quasi-static -- Dynamic testing of materials -- Material behavior under dynamics loading, modeling and experiments -- Analysis of some high-speed impact problems in the aircraft industry -- Computer estimation of plastic strain localization and failure for large strain rates using viscoplasticity -- Inelastic flow and failure of metallic solids accounting for asymmetry of elastic range and micro-shear banding.

   Sommario/riassunto   The book describes behavior of materials (ductile, brittle and composites) under impact loadings and high strain rates. The three aspects: experimental, theoretical and numerical are in the focus of interest. Hopkinson bars are mainly used as experimental devices to describe dynamic behavior of materials. The precise description of experimental techniques and interpretation of wave interaction are carefully discussed. Theoretical background refers to rate dependent thermoviscoplastic formulation. This includes the discussion of well posedness of initial boundary value problems and the solution of the system of governing equations using numerical methods. Explicit time integration is used in computations to solve dynamic problems. In addition, many applications in aeronautic and automotive industries are exposed.