1. Record Nr. UNINA9910483118803321

Titolo	Dynamics, strength of materials and durability in multiscale mechanics / / Francesco dell'Isola, Leonid Igumnov, editors
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] Â©2021
ISBN	3-030-53755-2
Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (XII, 403 p. 227 illus., 170 illus. in color.)
Collana	Advanced Structured Materials, , 1869-8433 ; ; 137
Disciplina	620.11230724
Soggetti	Materials - Mechanical properties - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Modeling fatigue life of structural alloys under block asymmetric loading -- 2. Excitation of the waves with a focused source, moving along the border of gradient-elastic half-space -- 3. On the spectrum of relaxation times in coupled diffusion and rheological processes in metal al-loys -- 4. Finite element method study of the protection damping elements dynamic deformation -- 5. Analyzing the problem of a spherical cavity expansion in a medium with Mohr-Coulomb-Tresca's plasticity condition.
Sommario/riassunto	This book reviews the mathematical modeling and experimental study of systems involving two or more different length scales. The effects of phenomena occurring at the lower length scales on the behavior at higher scales are of intrinsic scientific interest, but can also be very effectively used to determine the behavior at higher length scales or at the macro-level. Efforts to exploit this micro- and macro-coupling are, naturally, being pursued with regard to every aspect of mechanical phenomena. This book focuses on the changes imposed on the dynamics, strength of materials and durability of mechanical systems by related multiscale phenomena. In particular, it addresses: 1: the impacts of effective dissipation due to kinetic energy trapped at lower scales 2: wave propagation in generalized continua 3: nonlinear phenomena in metamaterials 4: the formalization of more general models to describe the exotic behavior of meta-materials 5: the design and study of microstructures aimed at increasing the toughness and

durability of novel materials.