1. Record Nr. UNINA9910921017403321

Autore	Eduard Starovoitov
Titolo	Deformation of Three-layer Structural Elements in Thermal Radiation Fields / / by Starovoitov Eduard, Michael Zhuravkov, Denis Leonenko, Yongtao Lyu
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	9789819772179 9819772176
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (489 pages)
Altri autori (Persone)	ZhuravkovMichael LeonenkoDenis LyuYongtao
Disciplina	620.105
Soggetti	Mechanics, Applied Solids Engineering mathematics Engineering - Data processing Solid Mechanics Mathematical and Computational Engineering Applications Engineering Mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Some Basic Information From Solid Mechanics -- Elastic Three-Layer Rods With Non-Compressible Filler -- Isothermal Deformation of Elastoplastic Three-Layered Rods -- Three-layer elastic-plastic rods in a temperature field -- Deformation Of A Three-Layer Rod In Neutron Flux -- Three-Layer Rod With Compressible Filler -- Elastic Circular Three-Layer Plates In A Temperature Field -- Cyclic Loading Of Three-Layer Elastoplastic Circular Plates -- Circular Three-Layer Plate In A Neutron Flux.
Sommario/riassunto	This book methodically details the formulations and approaches to solve boundary value problems, which are essential for determining the stress–strain states in three-layer rods and plates subjected to both single and quasi-static variable loads in thermal radiation and force

fields. It duly considers the complex influences on the physically nonlinear properties of the materials in each layer. The book offers several innovative analytical solutions and a numerical parametric analysis of the stress–strain scenarios in these structures. It describes the deformation of physically nonlinear media in thermoradiational fields within the small elastic-plastic deformations theory framework. The work explores variational problem-solving methods and the elastic solution method. It presents a formula for calculating the temperature within a three-layer assembly, derived by averaging the thermophysical properties of the materials across the layers' thickness. Additionally, the book includes an analysis of the attenuation of neutron flux as it passes through a three-layer element.