1. Record Nr. UNINA9910811896703321 Autore Bhaskar K. Titolo Plates: theories and applications // K. Bhaskar, T. K. Varadan Pubbl/distr/stampa New Delhi, India;; Chichester, England:,: Wiley:,: Ane Books Pvt. Ltd., , 2014 ©2014 **ISBN** 1-118-89389-1 1-118-89470-7 1-118-89480-4 Descrizione fisica 1 online resource (357 p.) Collana Ane/Athena Books Disciplina 620.2 Soggetti Acoustical engineering Geology, Stratigraphic Plate tectonics Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Includes index. Nota di contenuto Cover; Title Page; Copyright; Preface; Contents; Part A Classical Theory and Straightforward Applications; 1 Definition of a Thin Plate; 1.1 The Elasticity Approach; 1.2 A Test Problem; 1.3 The Case of a Thin Plate: 2 Classical Plate Theory: 2.1 Assumptions of Classical Plate Theory; 2.2 Moment-Curvature Relations; 2.3 Equilibrium Equations; 2.4 Governing Biharmonic Equation; 2.5 Boundary Conditions; 2.6 Solution of a Problem; 2.7 Inclusion of an Elastic Foundation/Thermal Effects; 2.7.1 Elastic Foundation; 2.7.2 Thermal Effects; 2.8 Strain Energy of the Plate 3 A Critical Assessment of Classical Plate Theory3.1 CPT Solution for the Test Problem of Section 1.2; 3.2 Comparison with the Elasticity Solution; 3.3 Why the Plane-Stress Constitutive Law?; 4 Analysis of Rectangular Plates; 4.1 Recapitulation of Fourier Series; 4.2 Navier's Method; 4.3 Levy's Method; 4.4 Closed-form Solution for a Plate with Corner Supports; 5 Analysis of Circular Plates; 5.1 Equations of the Theory of Elasticity; 5.2 Equations of CPT; 5.3 Solution of Axisymmetric

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Sommario/riassunto

Plates: Theories and Applications provides a comprehensive introduction to plate structures, covering classical theory and applications. It considers plate structures in several forms, starting from the simple uniform, thin, homogeneous metallic structure to more efficient and durable alternatives involving features such as variable-thickness, lamination, sandwich construction, fiber reinforcement, functional gradation, and moderately-thick to very-thick geometry. Different theoretical models are then discussed for analysis and design purposes starting from the classical thin plate