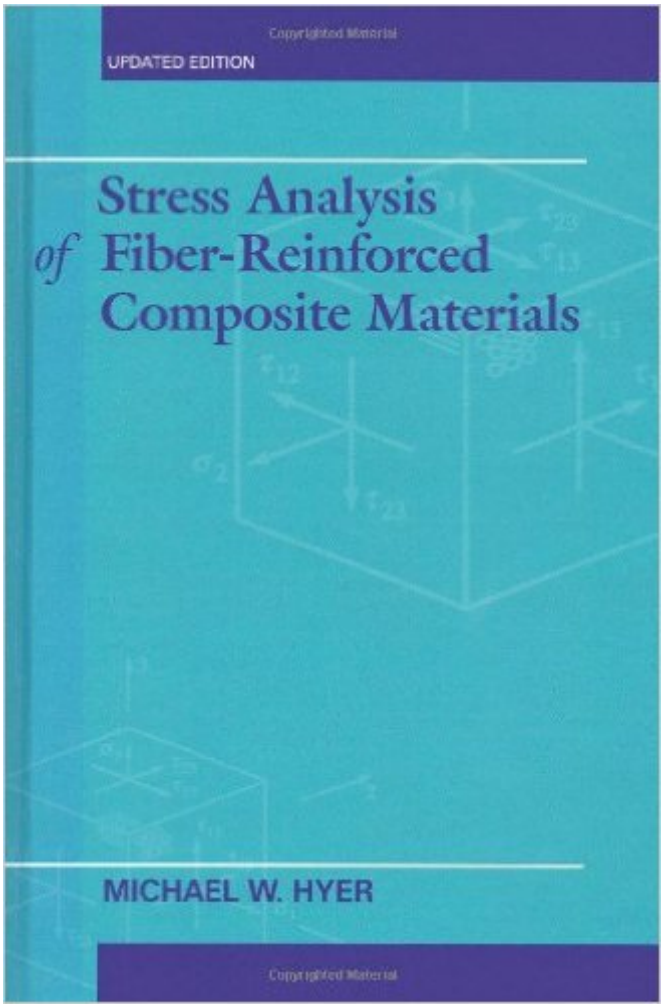
Stress Analysis Of Fiber-Reinforced Composite Materials



Synopsis

Updated and improved, Stress Analysis of Fiber-Reinforced Composite Materials, Hyer's work remains the definitive introduction to the use of mechanics to understand stresses in composites caused by deformations, loading, and temperature changes. In contrast to a materials science approach, Hyer emphasizes the micromechanics of stress and deformation for composite material analysis. The book provides invaluable analytic tools for students and engineers seeking to understand composite properties and failure limits. A key feature is a series of analytic problems continuing throughout the text, starting from relatively simple problems, which are built up step-by-step with accompanying calculations. The problem series uses the same material properties, so the impact of the elastic and thermal expansion properties for a single-layer of FR material on the stress, strains, elastic properties, thermal expansion and failure stress of cross-ply and angle-ply symmetric and unsymmetric laminates can be evaluated. The book shows how thermally induced stresses and strains due to curing, add to or subtract from those due to applied loads. Another important element, and one unique to this book, is an emphasis on the difference between specifying the applied loads, i.e., force and moment results, often the case in practice, versus specifying strains and curvatures and determining the subsequent stresses and force and moment results. This represents a fundamental distinction in solid mechanics.Table of Contents follows: 1. Fiber-Reinforced Composite Materials 2. Linear Elastic Stress-Strain Characteristics of Fiber-Reinforced Material 3. Prediction of Engineering Properties Using Micromechanics 4. The Plane-Stress Assumption 5. Plane-Stress Stress-Strain Relations in a Global Coordinate System 6. Classical Lamination Theory: The Kirchhoff Hypothesis and Its Implications 7. Classical Lamination Theory: Laminate Stiffness Matrix 8. Classical Lamination Theory: Additional Examples 9. Failure Theories for Fiber-Reinforced Materials: Maximum Stress Criterion 10. Failure Theories for Fiber-Reinforced Materials: The Tsai-Wu Criterion 11. Environmentally Induced Stresses in Laminates 12. Through-Thickness Laminate Strains 13. Introduction to Fiber-Reinforced Laminated Plates 14. Appendix: Manufacturing Composite Laminates

Book Information

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Customer Reviews

Mike, one of the most respected authorities in the field of composite materials, introduces you to the fundamentals of composites and takes you all the way through to failure theories. Rule of mixtures, classical lamination theory, stress analysis, failure theories...it’s all here and explained simply. Well written, great examples and problems, fantasic organization. It’s been my main bible for over ten years.

This is indeed a good book. Subject matter is well organized, explanations are clear. For the beginning courses in the mechanics of composite meterials, this may perhaps be one of the best books available today.

(first) Edition (10/15/2005) High Fiber Foods For A High Fiber Diet Fat, Fiber & Low Sugar Cookbook: Give the Low Sugar High Fiber Diet a Chance - 40 Delicious & Healthy Recipes That Your Family Will Love High Fiber Recipes: Whole and Healthy High Fiber Recipes For Breakfast, Lunch, Dinner and More (The Easy Recipe) The Frequent Fiber Cookbook: Easy and Delicious Recipes and Tips for People on a High Fiber Diet Design of Reinforced Concrete, 10th Edition Reinforced Concrete Design