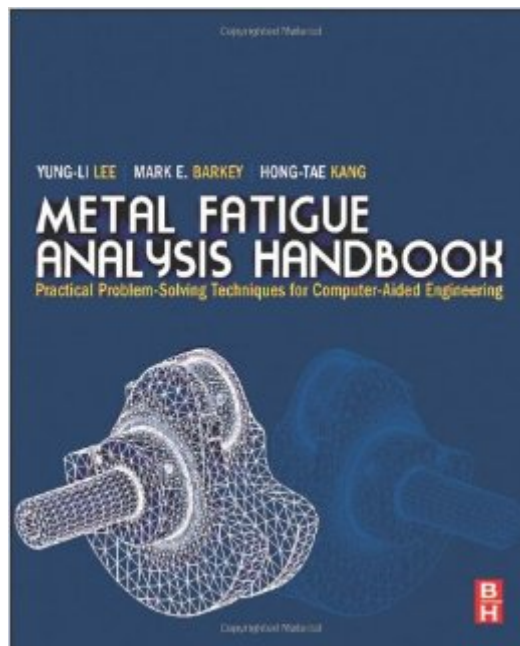# Metal Fatigue Analysis Handbook: Practical Problem-solving Techniques For Computer-aided Engineering

Synopsis

Understand why fatigue happens and how to model, simulate, design and test for it with this practical, industry-focused reference Written to bridge the technology gap between academia and industry, the Metal Fatigue Analysis Handbook presents state-of-the-art fatigue theories and technologies alongside more commonly used practices, with working examples included to provide an informative, practical, complete toolkit of fatigue analysis. Prepared by an expert team with extensive industrial, research and professorial experience, the book will help you to understand: Critical factors that cause and affect fatigue in the materials and structures relating to your workLoad and stress analysis in addition to fatigue damage-the latter being the sole focus of many books on the topic How to design with fatigue in mind to meet durability requirementsHow to model, simulate and test with different materials in different fatigue scenariosThe importance and limitations of different models for cost effective and efficient testing Whilst the book focuses on theories commonly used in the automotive industry, it is also an ideal resource for engineers and analysts in other disciplines such as aerospace engineering, civil engineering, offshore engineering, and industrial engineering.The only book on the market to address state-of-the-art technologies in load, stress and fatigue damage analyses and their application to engineering design for durabilityIntended to bridge the technology gap between academia and industry - written by an expert team with extensive industrial, research and professorial experience in fatigue analysis and testing An advanced mechanical engineering design handbook focused on the needs of professional engineers within automotive, aerospace and related industrial disciplines

Book Information

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Customer Reviews

The new book from Lee, Barkey and Kang, Metal Fatigue Analysis Handbook, should be in the library of everyone involved in fatigue analysis at any level. While it calls itself a handbook, it goes far beyond the scope of most handbooks by including in-depth explanations of nearly all of the analysis techniques that are likely to be employed by engineers and scientists who work on durability and fatigue issues in any ground-based transportation and machinery industries. The book is replete with example problems that are explained in much greater detail than is typically seen in books on this topic. It is also richly illustrated and thoroughly referenced. The book covers all of the issues and topics that most ground vehicle engineers will address, from the basics of stress-based uniaxial fatigue analysis, to advanced multiaxial strain-based analysis, and the very specialized and often overlooked topics of vibration fatigue, weld fatigue life-prediction and the finite element analysis (FEA) of bolted joints. There are 12 chapters in all. Chapter 1, Road Load Analysis Techniques in Automotive Engineering, covers the types of loads and load histories that automobiles are subjected to, and how those loads are captured and converted into component stresses and strains that can be further analyzed. It describes the standard testing and analysis procedures that are employed, the instruments that record data, and the commercial FEA models that are used to analyze the data. Chapter 2, Psuedo Stress Analysis Techniques, delves into the fundamentals of the linear-elastic FEA methods that are the most commonly used techniques for static stress and modal transient stress response analyses.

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