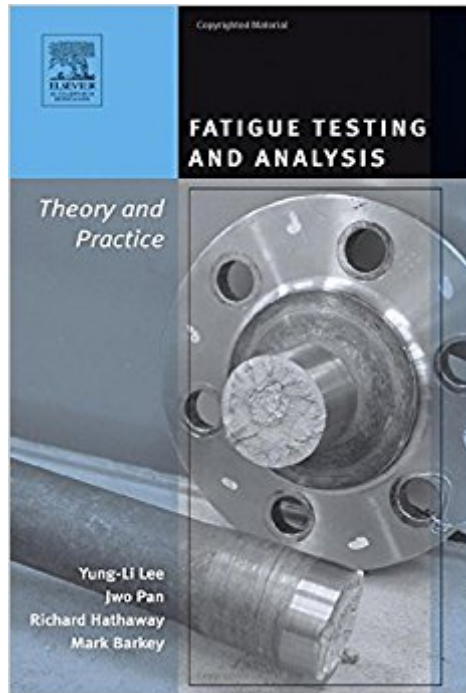


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# Fatigue Testing And Analysis: Theory And Practice



## Synopsis

Fatigue Testing and Analysis: Theory and Practice presents the latest, proven techniques for fatigue data acquisition, data analysis, and test planning and practice. More specifically, it covers the most comprehensive methods to capture the component load, to characterize the scatter of product fatigue resistance and loading, to perform the fatigue damage assessment of a product, and to develop an accelerated life test plan for reliability target demonstration. This book is most useful for test and design engineers in the ground vehicle industry. Fatigue Testing and Analysis introduces the methods to account for variability of loads and statistical fatigue properties that are useful for further probabilistic fatigue analysis. The text incorporates and demonstrates approaches that account for randomness of loading and materials, and covers the applications and demonstrations of both linear and double-linear damage rules. The reader will benefit from summaries of load transducer designs and data acquisition techniques, applications of both linear and non-linear damage rules and methods, and techniques to determine the statistical fatigue properties for the nominal stress-life and the local strain-life methods. Covers the useful techniques for component load measurement and data acquisition, fatigue properties determination, fatigue analysis, and accelerated life test criteria development, and, most importantly, test plans for reliability demonstrations. Written from a practical point of view, based on the authors' industrial and academic experience in automotive engineering design. Extensive practical examples are used to illustrate the main concepts in all chapters.

## Book Information

Hardcover: 416 pages

Publisher: Butterworth-Heinemann; 1 edition (August 12, 2004)

Language: English

ISBN-10: 0750677198

ISBN-13: 978-0750677196

Product Dimensions: 6 x 0.9 x 9 inches

Shipping Weight: 1.7 pounds (View shipping rates and policies)

Average Customer Review: 4.8 out of 5 stars 5 customer reviews

Best Sellers Rank: #1,398,067 in Books (See Top 100 in Books) #44 in Books > Engineering & Transportation > Engineering > Materials & Material Science > Fracture Mechanics #883 in Books > Science & Math > Physics > Mechanics #1241 in Books > Textbooks > Engineering > Civil Engineering

## Customer Reviews

"If you have only one book on fatigue, this should be the one. This book is an excellent blend of the underlying science of fatigue and the application of this knowledge to the art of fatigue design and analysis. It will be useful to both testing and design engineers... This book is an excellent beginning for practicing engineers who wish to gain a better understanding of the various techniques used for fatigue assessment of structures and components. At the same time experts will find it a useful reference for many of the newer methods and techniques." --International Journal of Pressure Vessels and Piping

Covers the broad scope of design theories and testing of mechanical components for fatigue and durability

Very well written book. It contains much of the information necessary to understand the fatigue theory. Methods used in fatigue analysis are given in detail. Additionally to the time domain fatigue analysis methods, the frequency domain fatigue analysis methods are also covered.

It's a great book with much detailed information. It helps me understand why and how analyze the fatigue. I would recommend this to all friends who are in this field.

Outstanding book on subject. It includes theoretical analytical methods and test methods Strongly recommend it. However, it does not include fractology section.

This book does an excellent job covering many topics in fatigue of metals from simple uniaxial constant load to complex damage accumulation theories. Two specific topics motivated me to buy the book. First, this is one of the few books to do a decent job of summarizing how to use statistical methods to generate an appropriate typical and design curve from a set of SN data. Whether you want to characterize the whole range of fatigue life or just the endurance limit, several test design and the statistical analysis of those test results are well covered. *MMPDS*, Chapter 9 and *Analysis and Representation of Fatigue Data* are more extensive on this topic but also overkill for many engineers. Second, this book has the best explanation I've ever read of the double linear damage rule. Only Gary Halford, himself, ever explained it better to me. Both of these subjects included theory and practical examples to ensure adequate understanding of the material. But I can't give it five stars because of organizational problems. Each chapter is written by

a different author. Everything you need to know for a chapter is not necessarily covered within that chapter or the ones before it. This wouldn't be so bad except that the index is awful. Major important topics are not even listed in the index (e.g., double linear damage rule). Page numbers are incorrect; I just spent 5 minutes looking for a good example but EVERY entry I picked from the index was incorrect. This was not a problem when I read the book cover-to-cover after I bought it. But I work for a living and when trying to use this book as a reference I always have to go looking for the info I need and that wastes time.

It is a well written book on fatigue-theory, methods, and testing process. It also contains numerical examples to demonstrate the theory in time history loading as well as spectral. I was working on fatigue due to random vibration. This book contains theory, recent advances, and few step by step numerical examples; that helped me to easily implement random vibration fatigue or fatigue due to PSD and ASD.

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