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# Fatigue Of Structures And Materials



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## Synopsis

Fatigue of structures and materials covers a wide scope of different topics. The purpose of the present book is to explain these topics, to indicate how they can be analyzed, and how this can contribute to the designing of fatigue resistant structures and to prevent structural fatigue problems in service. Chapter 1 gives a general survey of the topic with brief comments on the significance of the aspects involved. This serves as a kind of a program for the following chapters. The central issues in this book are predictions of fatigue properties and designing against fatigue. These objectives cannot be realized without a physical and mechanical understanding of all relevant conditions. In Chapter 2 the book starts with basic concepts of what happens in the material of a structure under cyclic loads. It illustrates the large number of variables which can affect fatigue properties and it provides the essential background knowledge for subsequent chapters. Different subjects are presented in the following main parts: • Basic chapters on fatigue properties and predictions (Chapters 2–8) • Load spectra and fatigue under variable-amplitude loading (Chapters 9–11) • Fatigue tests and scatter (Chapters 12 and 13) • Special fatigue conditions (Chapters 14–17) • Fatigue of joints and structures (Chapters 18–20) • Fiber-metal laminates (Chapter 21) Each chapter presents a discussion of a specific subject.

## Book Information

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## Customer Reviews

This book Fatigue of Structures and Materials has won the TAA "Texty" Textbook Excellence Award in 2010.

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I find this book is helpful and full of information on Fatigue. Schijve has an easy to read writing style. I first learned this from his paper, "Fatigue of Structures and Materials in the 20th Century and the State of the Art." This paper is practically a introduction to many of the chapters in the book. This book is worth having to mark-up and take notes. If you are interested in the extra materials, you can download them here: [extras.springer.com](http://extras.springer.com) then enter the ISBN: 978-1-4020-6807-2

This book is exactly what I was looking for because it lays great foundation for understanding fatigue failures, both macro and microscopically. Although I am still reading it, each chapter is a revelation. After conducting numerous failure investigations, I've realized that failure initiation and understanding it in great detail is key in developing a root cause. In my opinion, this book offers greater detail than most when describing what transpires in a material that is under fatigue loading. Concepts in this book can help strengthen your knowledge on crack initiation as applicable to all failures, not just fatigue.

Excellent for a clear understanding the fatigue phenomenon, the growth of cracks, the influences of surface condition and metallographic structure, and how to design to minimise fatigue.

better than expected.

Good reference book.

Jaap is well known in the fatigue community and this book is a great reference for all that work with fatigue.

I have been working for two years as structural engineer, and the knowledge of fatigue by most people was always suspicious for me. Unfortunately, I was dependant on people's knowledge to obtain mine and, by looking for many books and papers on internet, all I found about fatigue were

precise formulas with no physical explanation of the phenomena. Although I was not a fatigue specialist, I had always the conviction that this theme was much more experimental and microscopical-dependant than mathematical. This book proved to me all of that, and gave me a great insight of fatigue. Fatigue has become a very interesting topic for me since this book. The writing style of the author is also very pleasant, and we can read the book as if it was a romance. I got a job at huge aerospace company for fatigue because of this book. I hope you enjoy it.

Great reference! This is the book we used for my Fatigue and Damage Tolerance course. I read it before the class and it gave me a good insight on fatigue. This book offers a lot of practical examples and beautifully written explanations of the Fatigue phenomena. Although it is not a fracture mechanics book, it does cover some fracture mechanics concepts as well. Must have for all Stress Engineers.

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