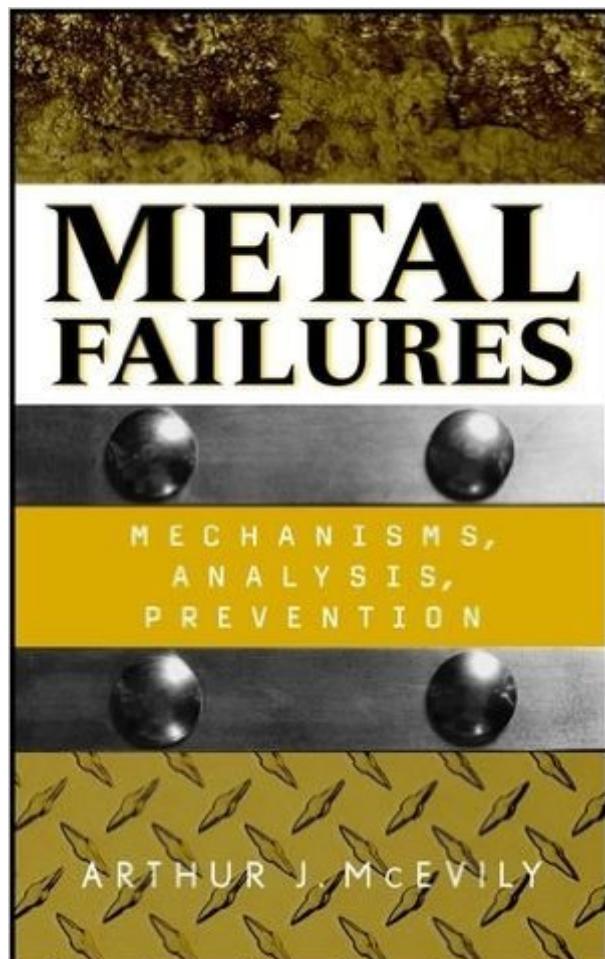


The book was found

# Metal Failures: Mechanisms, Analysis, Prevention



## Synopsis

comprehensive coverage of both the "how" and "why" of metal failures. Metal Failures gives engineers the intellectual tools and practical understanding needed to analyze failures from a structural point of view. Its proven methods of examination and analysis enable investigators to: \* Reach correct, fact-based conclusions on the causes of metal failures \* Present and defend these conclusions before highly critical bodies \* Suggest design improvements that may prevent future failures. Analytical methods presented include stress analysis, fracture mechanics, fatigue analysis, corrosion science, and nondestructive testing. Numerous case studies illustrate the application of basic principles of metallurgy and failure analysis to a wide variety of real-world situations. Readers learn how to investigate and analyze failures that involve: \* Alloys and coatings \* Brittle and ductile fractures \* Thermal and residual stresses \* Creep and fatigue \* Corrosion, hydrogen embrittlement, and stress-corrosion cracking. This useful professional reference is also an excellent learning tool for senior-level students in mechanical, materials, and civil engineering.

## Book Information

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## Customer Reviews

This text provides perhaps the most concise and authoritative resource for the field of Metallurgical Failure Analysis that I have read. Rather than approaching failures from a cookbook perspective, that is only linking cause to failure through single case histories, this author presents the fundamental concepts of the discipline and supplements them with appropriate examples. After reading the book, I am considering using it as a text to a course that previously could only be

approached with personal course notes. This is the most comprehensive and fundamentally organized book I have read in years. Well worth twice the price.

This well-written reference has everything I wanted it to have but would not have expected to find in one reference. There is even a section near and dear to a forensic engineer's heart: the technical report; record keeping & testimony; depositions; pretrial preparation; testimony & cross-examination (XVI through XVIII). Cleverly, the book starts out with case histories that made the news (fiction authors would call this "the hook"), and then goes on to devote subsequent chapters on the different types of failure mechanisms all of which are presented in clear, no nonsense language. There are sections on: optical examination with various electron microscopes; spectrographic and other chemical analyses; x-ray analysis; statistical distributions; creep failure; fatigue; defects; corrosion; oil & gas pipelines; and rare look at crane hooks, coil springs, roller bearings, bushings, and gears. Additional case histories populate each technical subject to add emphasis and give a real world perspective on things. Bravo!

Why is so little published on product failure? The subject is serious enough given the dire consequences if the product carries passengers, for example. Analysis of major disasters is a well-known genre, such as the seemingly endless books about the loss of The Titanic, but failures where large loss of life does not occur seem under-published. Yet they can be just as important in revealing potential design flaws which could lead to much worse when unrecognised, or not addressed by product designers. The subject of forensic engineering has grown fast in the last two decades, prompted by the growth in litigation, which demands that expert investigation is undertaken to determine the cause or causes of specific failures. The present book attempts to address the problems of metal product failures in a very detailed and comprehensive examination of the failure of metal products. It identifies the major failure modes, such as fatigue, corrosion and under-design, and describes the ways of circumventing the problems. If there is any drawback, it is that other materials are not included, such as polymers, ceramics or glasses. The book is very well illustrated with numerous cases studies, many from the files of the author, and it deserves a wide readership.

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Metal Failures: Mechanisms, Analysis, Prevention Systematic Analysis of Gear Failures

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