

Metal Failures: Mechanisms, Analysis, Prevention

By Arthur J. McEvily, Jirapong Kasivitamnuay

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One of the only texts available to cover not only how failure occurs but also examine methods developed to expose the reasons for failure, *Metal Failures* has long been considered the most definitive and authoritative resources in metallurgical failure analysis. Now in a completely revised edition, this Second Edition features updates of all chapters plus new coverage of elastic behavior and plastic deformation, localized necking, the phenomenological aspects of fatigue, fatigue crack propagation, alloys and coatings, tensors and tensor notations, and much more.

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Editorial Review

From the Back Cover

Comprehensive coverage of both the "how" and "why" of metal failures—revised and updated

Metal Failures has become a classic engineering resource known for its concise and authoritative treatment of both the mechanisms of metal failure and the examination methods used to determine the reasons for failure. This *Second Edition* has been updated throughout, and features new or expanded coverage of topics including elastic behavior and plastic deformation, localized necking, the phenomenological aspects of fatigue, fatigue crack propagation, the staircase method, alloys and coatings, tensors, and tensor notations.

The analytical methods presented in the book 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. Sample problems and solutions are also provided to help bridge the gap between theory and application. Readers learn how to investigate and analyze failures that involve:

- Alloys and coatings
- Thermal and residual stresses
- Corrosion and cracking
- Brittle and ductile fractures
- Creep and fatigue
- Friction and wear

The proven methods of examination and analysis presented in this book enable investigators to conduct successful investigations of the causes of metal failures that may lead to design or manufacturing improvements that prevent future failures.

Metal Failures, Second Edition is an excellent learning tool for senior-level students in mechanical, materials, aerospace, and civil engineering, as well as for professionals involved in metal failure analysis.

About the Author

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