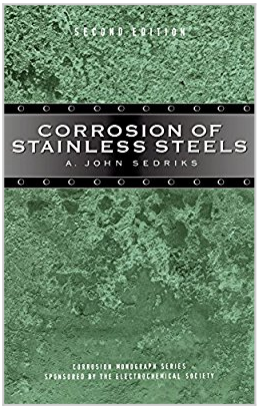

Corrosion of Stainless Steels

By A. John Sedriks

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A Complete, Up-to-Date Introduction to Corrosion of Stainless Steels and Metallurgical Factors This fully updated Second Edition of Corrosion of Stainless Steels covers the tremendous advances made with stainless steels in recent decades, including applications in many new areas--from marine technologies and off-shore oil production to power plants and the kitchen sink. This book offers unique insights into the corrosion mechanisms affecting stainless steels, details problem-avoidance strategies, and helps identify corrosion-resistant capabilities for these remarkable alloys Sponsored by the Electrochemical Society, Corrosion os Stainless Steels
* Provides a comprehensive introduction to the selection, development, and production of all types of stainless steels
* Emphasizes how metallurgical factors affect corrosion resistance
* Examines the limitations of stainless steels within the context of a discussion on higher alloys
* Takes an interdisciplinary approach that demonstrates the combined effects of metallurgy, chemistry, and electrochemistry on corrosion resistance
* Provides baseline knowledge and testing standards for stainless steels, and facilitates failure analysis for industrial purposes or litigation related to equipment failure
This is a much-needed text for materials scientists, chemical engineers, corrosion specialists, graduate students, and anyone who needs to be brought up to date on this subject.

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- Rank: #970150 in Books
- Brand: A John Sedriks
- Published on: 1996-04-19
- Original language: English
- Number of items: 1
- Dimensions: 9.33" h x 1.44" w x 6.28" l, 1.87 pounds
- Binding: Hardcover
- 464 pages

Editorial Review

From the Inside Flap
Because of their resistance to corrosion, stainless steels are widely used as construction materials. Recent decades, however, have seen a trend toward more demanding technological applications in increasingly more corrosive ambient and high-temperature environments. The continuing interest in corrosion resistance has resulted in the development of new stainless steels, although not all of the newly developed materials combine the greater strength and higher corrosion resistance of the new duplex grades. Some are lower cost utility grades for entirely different applications. Now more than ever it is crucial to understand the limits of use of different types of stainless steel and gain insight into their behavior. Corrosion of Stainless Steels, Second Edition describes the current understanding of corrosion resistance of stainless steels and emphasizes the role of metallurgical factors in creating this resistance. A thorough introduction to the selection, development, and production of stainless steels, it clarifies numerous issues and provides an interdisciplinary treatment that combines metallurgy, chemistry, and electrochemistry. Author A. John Sedriks notes the advantages of stainless steels in many new applications in offshore oil production, marine technologies, power generation, and domestic equipment manufacturing. He offers extended discussions of newer materials and incorporates accumulated knowledge about corrosion into the coverage of older alloys. He discusses the corrosion-resistant characteristics of austenitic, ferritic, duplex, martensitic, and precipitation hardening stainless steels and devotes several chapters to localized forms of corrosion such as pitting, crevice corrosion, and stress corrosion cracking. Composition, microstructure, and other factors that influence the materials' behavior are presented in detail, and testing procedures are examined in the context of historic failures. A full chapter explores the general corrosion of stainless steels in acids and alkalis, and another describes high-temperature corrosion by oxidation, sulfidation, etc. This remarkably well-crafted Second Edition integrates the metallurgy and corrosion behavior of stainless steels and encourages corrosion control through a combination of metallurgy and materials selection. It identifies areas where further research is needed, provides detailed background for research projects, and reduces the need for literature searches. Here is the authoritative stainless-steel text and resource guide for scientists, engineers, corrosion technologists, corrosion consultants, failure analysts, expert witnesses, and graduate students in electrochemistry, materials science, and chemical and mechanical engineering.

From the Back Cover
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About the Author
About the author A. JOHN SEDRIKS is an internationally recognized researcher who specializes in corrosion control by metallurgical modifications. He is responsible for corrosion research at the Office of Naval Research, Arlington, Virginia, where he has worked since 1984. His previous affiliations included Inco's Research and Development Centers in New York and in England, Martin-Marietta's Research Institute for Advanced Studies in Baltimore, and the Defense Standards Laboratories in Sydney, Australia. He was involved in the development of Inconel alloy 690 and other alloys, and in corrosion programs for nuclear power plants, among other projects. Dr. Sedriks is the author of Stress Corrosion Cracking Test Methods as well as numerous journal articles and reports.

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