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Materials Science : Tribology, Corrosion and Coatings

Pedferri, Pietro

Corrosion Science and Engineering

- Explores the science of corrosion, the principles and the theoretical background, prevention and protection systems, and various forms of corrosion
- Provides a comprehensive and rigorous analysis of the most relevant parameters used to quantify corrosion damage
- Includes the engineering tools needed to make a proper corrosion assessment and select the optimal protection technique, depending on the specific aggressive environment and the desired service life
- Pictures, figures, graphs and schematic models help ensure a clearer understanding of the science and engineering of corrosion.
- Edited by Luciano Lazzari and MariaPia Pedferri

This textbook discusses the latest advances in the corrosion of metals and related protection methods, and explores all corrosion-related aspects used in natural and industrial environments, including monitoring and testing. Throughout the textbook, the science and engineering of corrosion are merged to help readers perform correct corrosion assessments in both the design phase and plant management phase, and to define the optimal protection technique. In addition, the book addresses basic aspects of corrosion science, including the electrochemical mechanism, thermodynamic and kinetic aspects, the use of Pourbaix and Evans diagrams, and various forms of corrosion (from uniform to localised to stress corrosion phenomena); as well as the protection systems adopted to combat corrosion, including inhibitors, coatings and cathodic protection. Such basic knowledge is fundamental to understanding the "corrosion engineering" approach applied to the durability of metals immersed in water, buried in soil, exposed to the atmosphere, used in reinforced concrete, in the human body and in petrochemical plants, or at risk of high-temperature corrosion. A final chapter is dedicated to the use of statistics in corrosion. All chapters include exercises and practical examples to help students understand, predict, evaluate and mitigate corrosion problems.

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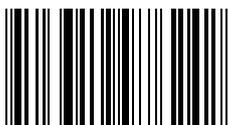
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