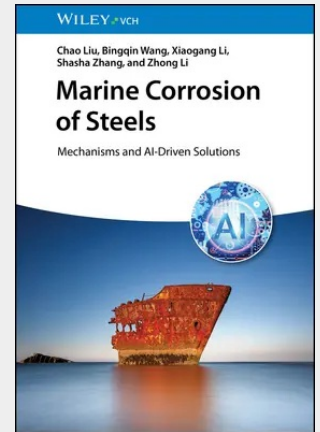


Marine Corrosion of Steels

Mechanisms and AI-Driven Solutions

Bridges corrosion science and artificial intelligence to advance durable, high-performance marine steels Understanding and controlling the corrosion of steels in marine environments is a critical challenge for modern engineering, with far-reaching implications for safety, durability, and sustainability. Marine corrosion not only threatens the integrity of infrastructure such as bridges, offshore platforms, and railways but also leads to significant economic losses and environmental risks. Marine Corrosion of Steels: Mechanisms and AI-Driven Solutions provides a comprehensive exploration of the mechanistic processes underlying steel degradation and introduces innovative, data-driven approaches to improve corrosion resistance. Offering valuable insights into stress corrosion cracking, fatigue, and general degradation mechanisms in harsh marine conditions, the book systematically investigates corrosion behavior across a range of engineering steels, including high-manganese steel, titanium-steel composites, low-alloy rebar, and ductile iron. Beyond mechanistic analysis, dedicated chapters highlight pioneering applications of big data and artificial intelligence, such as predictive modeling, image recognition for pit analysis, and IoT-enabled real-time monitoring. These AI-driven approaches enable researchers and engineers to accelerate alloy design, optimize material selection, and implement proactive maintenance strategies. Combining deep scientific understanding with cutting-edge computational tools, Marine Corrosion of Steels: Mechanisms and AI-Driven Solutions: - Demonstrates how corrosion science is evolving toward intelligent, sustainable solutions for the most demanding industrial applications - Explores alloying strategies and material innovations to enhance corrosion resistance - Introduces novel electrochemical evaluation methods and image-based corrosion quantification - Presents real-world case studies, including corrosion fatigue in railway components and offshore steel performance - Discusses multi-modal frameworks combining physics, machine learning, and computer vision - Offers forward-looking insights on AI-driven alloy design for sustainability and cost reduction Connecting fundamental research to practical engineering solutions across multiple industries, Marine Corrosion of Steels: Mechanisms and AI-Driven Solutions is an essential resource for graduate-level courses in materials science, corrosion engineering, and mechanical engineering, particularly within programs in metallurgy, chemical engineering, and civil infrastructure. It is also a valuable reference for engineers, corrosion specialists, and researchers working in marine, aerospace, and energy industries.



199,00 €

185,98 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783527355938

Medium: Buch

ISBN: 978-3-527-35593-8

Verlag: WILEY-VCH

Erscheinungstermin: 15.04.2026

Sprache(n): Englisch

Auflage: 1. Auflage 2026

Produktform: Gebunden

Gewicht: 680 g

Seiten: 608

Format (B x H): 170 x 244 mm

