

Asm Handbook Volume 11 Failure Analysis And Prevention

Handbook of Thermal Spray Technology
The Nalco Water Guide to Cooling Water Systems Failure Analysis, Second Edition
ASM Handbook Systematic Analysis of Gear Failures
Applied Engineering Failure Analysis
Metallography, Principles and Practice
Fractography of Advanced Ceramics III
ASM Handbook ASM Specialty Handbook
Heat Treating Progress Metallurgy for the Non-Metallurgist, Second Edition
ASM Handbook Handbook of Materials Failure Analysis with Case Studies from the Aerospace and Automotive Industries
ASM Handbook Mechanics and Mechanisms of Fracture
ASM Handbook: Fatigue and fracture
ASM handbook Nalco Water Guide to Boiler Failure Analysis, Second Edition
Metals Handbook Weld Integrity and Performance
Welding Metallurgy and Weldability
Metals Handbook. 9th Ed. Vol. 11. Failure Analysis and Prevention
Failure Analysis of Materials: An Introduction
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Microelectronics Failure Analysis
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Fractography in Failure Analysis of Polymers
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Materials Structure & Micromechanics of Fracture
VICorrosion in the Petrochemical Industry
ASM Handbook How to Organize and Run a Failure Investigation
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Electronic Materials Handbook
ASM Handbook Advanced Materials & Processes
Nalco Guide to Boiler Failure Analysis, 2nd Edition
Handbook of Materials Failure Analysis
Metal Failures
Failure Analysis and Fractography of Polymer Composites

Handbook of Thermal Spray Technology

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.

The Nalco Water Guide to Cooling Water Systems Failure Analysis, Second Edition

ASM Handbook

Systematic Analysis of Gear Failures

A comprehensive collection of peer-reviewed data and information on corrosion in the petroleum, petrochemical, and chemical processing industries from a number of ASM International publications. The principal sources are Corrosion, Volume 13, and Failure Analysis and Prevention, Volume 11 of ASM H

Applied Engineering Failure Analysis

Key articles from over 10 separate ASM publications are brought together as a practical reference on weld integrity crack prevention. This book thoroughly covers the essentials of weld solidification and cracking, weldability and material selection, process control and heat treatment, failure analysis, and fatigue and fracture mechanics weldments. Contents also include an appendix for quick reference of tabular data on weldability of alloys, process selection, recommended interpass and heat treatment temperatures, and qualification codes and standards.

Metallography, Principles and Practice

Explores the detailed steps necessary to determine the causes of failure. First, the physical characteristics of a gear are studied: where the stress points are, from what directions the forces are applied, where the movement of material progresses, and where strain patterns exist. Second, all external conditions and forces are considered. With this background information, a systematic examination is described from beginning to end, the end being a conclusion about the mode and cause of failure.

Fractography of Advanced Ceramics III

Fractography in Failure Analysis of Polymers provides a practical guide to the science of fractography and its application in the failure analysis of plastic components. In addition to a brief background on the theory of fractography, the authors discuss the various fractographic tools and techniques used to identify key fracture characteristics. Case studies are included for a wide range of polymer types, applications, and failure modes, as well as best practice guidelines enabling engineers to apply these lessons to their own work. Detailed images and their appropriate context are presented for reference in failure investigations. This text is vital for engineers who must determine the root causes of failure when it occurs, helping them further study the ramifications of product liability claims, environmental concerns, and brand image. Presents a comprehensive guide to applied fractography, enabling improved reliability and longevity of plastic parts and products Includes case studies that demonstrate material selection decisions and how to reduce failure rates Provides best practices on how to analyze the cause of material failures, along with guidelines on improving design and manufacturing decisions

ASM Handbook

ASM Specialty Handbook

This work offers a comprehensive source of information on metallographic techniques and their application to the study of metals, ceramics, and polymers. It contains an extensive collection of micro- and macrographs.

Heat Treating Progress

This reference covers principles, processes, types of coatings, applications, performance, and testing and analysis of thermal spray technology. It will serve as an introduction and guide for those new to thermal spray, and as a reference for specifiers and users of thermal spray coatings and thermal spray experts. Coverage encompasses basics of th

Metallurgy for the Non-Metallurgist, Second Edition

The main goal of these proceedings was to demonstrate the use of a variety of multi-scale approaches, ranging from the atomistic to the macroscopic, and in this it succeeds admirably. The special collection includes more than 130 peer-reviewed papers on atomistic, mesoscopic, macroscopic and multiscale approaches.

ASM Handbook

Handbook of Materials Failure Analysis with Case Studies from the Aerospace and Automotive Industries

ASM Handbook

These volumes cover the properties, processing, and applications of metals and nonmetallic engineering materials. They are designed to provide the authoritative information and data necessary for the appropriate selection of materials to meet critical design and performance criteria.

Mechanics and Mechanisms of Fracture

Presents more than 120 expert failure analysis case histories from industries including automotive, aerospace, utilities, oil and gas, petrochemical, biomedical, ground transportation, off-highway vehicles, and more. Volume 2 builds on the tremendous acceptance of Volume 1 by the failure analysis community. The two volumes can also be purchased as a set for a special discounted price. Learn how others have investigated and solved failures in various industries involving a wide range of failure modes, materials, and analysis techniques.

ASM Handbook: Fatigue and fracture

Includes bibliographical references and index.

ASM handbook

Nalco Water Guide to Boiler Failure Analysis, Second Edition

A comprehensive reference on the properties, selection, processing, and

applications of the most widely used nonmetallic engineering materials. Section 1, General Information and Data, contains information applicable both to polymers and to ceramics and glasses. It includes an illustrated glossary, a collection of engineering tables and data, and a guide to materials selection. Sections 2 through 7 focus on polymeric materials--plastics, elastomers, polymer-matrix composites, adhesives, and sealants--with the information largely updated and expanded from the first three volumes of the Engineered Materials Handbook. Ceramics and glasses are covered in Sections 8 through 12, also with updated and expanded information. Annotation copyright by Book News, Inc., Portland, OR

Metals Handbook

Volume 1: Packaging is an authoritative reference source of practical information for the design or process engineer who must make informed day-to-day decisions about the materials and processes of microelectronic packaging. Its 117 articles offer the collective knowledge, wisdom, and judgement of 407 microelectronics packaging experts--authors, co-authors, and reviewers--representing 192 companies, universities, laboratories, and other organizations. This is the inaugural volume of ASM's all-new Electronic Materials Handbook series, designed to be the Metals Handbook of electronics technology. In over 65 years of publishing the Metals Handbook, ASM has developed a unique editorial method of compiling large technical reference books. ASM's access to leading materials technology experts enables to organize these books on an industry consensus basis. Behind every article is an author who is a top expert in its specific subject area. This multi-author approach ensures the best, most timely information throughout. Individually selected panels of 5 and 6 peers review each article for technical accuracy, generic point of view, and completeness. Volumes in the Electronic Materials Handbook series are multidisciplinary, to reflect industry practice applied in integrating multiple technology disciplines necessary to any program in advanced electronics. Volume 1: Packaging focusing on the middle level of the electronics technology size spectrum, offers the greatest practical value to the largest and broadest group of users. Future volumes in the series will address topics on larger (integrated electronic assemblies) and smaller (semiconductor materials and devices) size levels.

Weld Integrity and Performance

The completely revised Second Edition of Metallurgy for the Non-Metallurgist provides a solid understanding of the basic principles and current practices of metallurgy. The new edition has been extensively updated with broader coverage of topics, new and improved illustrations, and more explanation of basic concepts. It is a "must-have" ready reference on metallurgy!

Welding Metallurgy and Weldability

If you are a manufacturing engineer, component designer, a materials failure analyst, or if you have a general interest in the nature and prevention of engineering failures, you will be interested in the new and substantial revision of ASM Handbook, Volume 11, Failure Analysis and Prevention. The new Volume 11,

with a focus on the root causes of failure, describes the principles, practices, and analytical techniques of failure analysis, so that root causes are properly identified and corrected for the ultimate objective of failure prevention. The newly reorganized Volume 11 begins with sections on the general engineering aspects of failure prevention, with coverage on fundamental root causes, materials selection, and the role of design reviews in failure prevention and analysis. Additional sections describe failures related to metals manufacturing operations, and the increasingly important role of life assessment methods in failure prevention. This is followed by a series of additional sections on the failure analysis process, as well as the principles, practices, tools, and techniques used to perform and evaluate failure analysis work, and the causes, mechanisms, appearances, and prevention methodology for the four classic types of failure (fracture, corrosion, wear, distortion). Contents include: Engineering Aspects of Failure and Prevention; Manufacturing Aspects of Failure and Prevention; Structural Life Assessment Methods; Principles and Practice of Failure Analysis; Tools and Techniques in Failure Analysis; Fracture; Corrosion Related Failures; Wear Failures; Distortion.

Metals Handbook. 9th Ed. Vol. 11. Failure Analysis and Prevention

Describes the weldability aspects of structural materials used in a wide variety of engineering structures, including steels, stainless steels, Ni-base alloys, and Al-base alloys Welding Metallurgy and Weldability describes weld failure mechanisms associated with either fabrication or service, and failure mechanisms related to microstructure of the weldment. Weldability issues are divided into fabrication and service related failures; early chapters address hot cracking, warm (solid-state) cracking, and cold cracking that occur during initial fabrication, or repair. Guidance on failure analysis is also provided, along with examples of SEM fractography that will aid in determining failure mechanisms. Welding Metallurgy and Weldability examines a number of weldability testing techniques that can be used to quantify susceptibility to various forms of weld cracking. Describes the mechanisms of weldability along with methods to improve weldability Includes an introduction to weldability testing and techniques, including strain-to-fracture and Vareststraint tests Chapters are illustrated with practical examples based on 30 plus years of experience in the field Illustrating the weldability aspects of structural materials used in a wide variety of engineering structures, Welding Metallurgy and Weldability provides engineers and students with the information needed to understand the basic concepts of welding metallurgy and to interpret the failures in welded components.

Failure Analysis of Materials: An Introduction

Applied Engineering Failure Analysis: Theory and Practice provides a point of reference for engineering failure analysis (EFA) cases, presenting a compilation of case studies covering a 35-year period, from the 1970s to 2012. This period spans the era from the time when slide rules were used routinely for engineering calculations, and when hard-copy photographs taken by film cameras were pasted onto typewritten sheets to make reports, to the present time when all these functions have become much less onerous through computer assistance. The cases

are drawn from such diverse fields as mechanical engineering, metallurgy, mining, civil/structural engineering, electrical power systems, and radiation damage; the last two topics are quite scarce in current publications. It includes theoretical content that deals with useful topics in basic theory, material properties, failure mechanisms, EFA methodology, and applications. It provides high-quality illustrations throughout, which greatly helps to promote the understanding of the failure characteristics described. This book offers an integrated approach that serves as a useful first reference in the above topics, for undergraduate and postgraduate students, as well as for practicing engineers. The book provides a hands-on approach to EFA, which helps the user to develop an understanding of potential failure situations, to explore the consequences, and to better understand how to solve similar problems; it also helps users to develop their own techniques for most other engineering failure problems. The authors include a section on technical report writing, which will assist failure investigators in getting their findings across. They also present simple engineering calculations that may serve as illustrative examples, and typical problems and solutions are included at the end of each chapter.

Handbook of Case Histories in Failure Analysis, Volume 2

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. The Most Complete, Current Guide to Failure Analysis for Cooling Water Systems Fully updated for the latest technologies and techniques, this new edition describes proven procedures for determining the root cause of cooling system failure, correcting the problem, and preventing future occurrences. The first section covers cooling water system design and operation and features ten new chapters on the various materials most commonly found in cooling systems. The remaining four sections discuss waterside corrosion, cracking, mechanical damage, and material and design issues. This authoritative resource explains how to identify failure locations and mechanisms, recognize critical factors influencing failure, carry out inspection procedures, and implement preventive measures to reducedamage. Illustrative case histories are provided in each chapter. The Nalco Guide to Cooling Water Systems Failure Analysis, Second Edition, covers: Carbon and alloy steel Cast iron Stainless steel Copper alloys Aluminum alloys Corrosion-resistant alloys Coatings Nonmetallic materials Brazed and soldered joints Corrosion monitoring Crevice and underdeposit corrosion Oxygen corrosion Biologically influenced corrosion Acid corrosion Alkaline corrosion Galvanic corrosion Dealloying Intergranular corrosion Graphitic corrosion Localized and pitting corrosion Corrosion fatigue Stress corrosion cracking Erosion-corrosion Cavitation Manufacturing defects Weld defects Design and operating conditions

Microelectronics Failure Analysis

Practical, up-to-date techniques for identifying and eliminating common causes of boiler failure Filled with more than 200 color images, The Nalco Guide to Boiler Failure Analysis, Second Edition categorizes distinct failure modes that typify nearly all boiler problems and walks you, step by step, through their solutions. Each type of failure is classified according to its location, general description, critical factors, identification, elimination, cautions, and related problems. Real-

world case histories are included throughout. This authoritative resource contains new chapters on: Phosphate corrosion Stress-assisted corrosion Steam and condensate damage Flow-accelerated corrosion Comprehensive coverage includes: Water- and steam-formed deposits * Short- and long-term overheating * Caustic corrosion * Low-pH corrosion * Hydrogen damage * Chelant complexing * Oxygen corrosion * Corrosion during cleaning * Corrosion fatigue cracking * Stress corrosion cracking * Graphitic corrosion * Dealloying * Cavitation * Erosion * Waterwall fireside corrosion * High-temperature furnace corrosion * Cold-end corrosion * Dew point corrosion * Fireside corrosion * Welding defects

Engineered Materials Handbook, Desk Edition

These volumes cover the properties, processing, and applications of metals and nonmetallic engineering materials. They are designed to provide the authoritative information and data necessary for the appropriate selection of materials to meet critical design and performance criteria.

Fractography in Failure Analysis of Polymers

If you are a manufacturing engineer, component designer, a materials failure analyst, or if you have a general interest in the nature and prevention of engineering failures, you will be interested in the new and substantial revision of ASM Handbook, Volume 11, Failure Analysis and Prevention. The new Volume 11, with a focus on the root causes of failure, describes the principles, practices, and analytical techniques of failure analysis, so that root causes are properly identified and corrected for the ultimate objective of failure prevention. The newly reorganized Volume 11 begins with sections on the general engineering aspects of failure prevention, with coverage on fundamental root causes, materials selection, and the role of design reviews in failure prevention and analysis. Additional sections describe failures related to metals manufacturing operations, and the increasingly important role of life assessment methods in failure prevention. This is followed by a series of additional sections on the failure analysis process, as well as the principles, practices, tools, and techniques used to perform and evaluate failure analysis work, and the causes, mechanisms, appearances, and prevention methodology for the four classic types of failure (fracture, corrosion, wear, distortion). Contents include: Engineering Aspects of Failure and Prevention; Manufacturing Aspects of Failure and Prevention; Structural Life Assessment Methods; Principles and Practice of Failure Analysis; Tools and Techniques in Failure Analysis; Fracture; Corrosion Related Failures; Wear Failures; Distortion.

ASM Handbook, Volume 11 - Failure Analysis and Prevention

Handbook of Materials Failure Analysis: With Case Studies from the Aerospace and Automotive Industries provides a thorough understanding of the reasons materials fail in certain situations, covering important scenarios, including material defects, mechanical failure as a result of improper design, corrosion, surface fracture, and other environmental causes. The book begins with a general overview of materials failure analysis and its importance, and then logically proceeds from a discussion of the failure analysis process, types of failure analysis, and specific tools and

techniques, to chapters on analysis of materials failure from various causes. Later chapters feature a selection of newer examples of failure analysis cases in such strategic industrial sectors as aerospace, oil & gas, and chemicals. Covers the most common types of materials failure, analysis, and possible solutions Provides the most up-to-date and balanced coverage of failure analysis, combining foundational knowledge, current research on the latest developments, and innovations in the field Ideal accompaniment for those interested in materials forensic investigation, failure of materials, static failure analysis, dynamic failure analysis, fatigue life prediction, rotorcraft, failure prediction, fatigue crack propagation, bevel pinion failure, gasketless flange, thermal barrier coatings Presents compelling new case studies from key industries to demonstrate concepts Highlights the role of site conditions, operating conditions at the time of failure, history of equipment and its operation, corrosion product sampling, metallurgical and electrochemical factors, and morphology of failure

Materials Structure & Micromechanics of Fracture VI

Corrosion in the Petrochemical Industry

If you are involved with machining or metalworking or you specify materials for industrial components, this book is an absolute must. It gives you detailed and comprehensive information about the selection, processing, and properties of materials for machining and metalworking applications. They include wrought and powder metallurgy tool steels, cobalt base alloys, cemented carbides, cermets, ceramics, and ultra-hard materials. You'll find specific guidelines for optimizing machining productivity through the proper selection of cutting tool materials plus expanded coverage on the use of coatings to extend cutting tool and die life. There is also valuable information on alternative heat treatments for improving the toughness of tool and die steels. All new material on the correlation of heat treatment microstructures and properties of tool steels is supplemented with dozens of photomicrographs. Information on special tooling considerations for demanding applications such as isothermal forging, die casting of metal matrix composites, and molding of corrosive plastics is also included. And you'll learn about alternatives to ferrous materials for metalworking applications such as carbides, cermets, ceramics, and nonferrous metals like aluminum, nickel, and copper base alloys.

ASM Handbook

The aim of this book is to make an important contribution to the development of new functional and structural ceramic materials, which exhibit enhanced performances and improved lifetimes and reliability, by fostering a better understanding of the mechanisms of their deterioration and failure under various stress conditions at various operating temperatures. Volume is indexed by Thomson Reuters CPCI-S (WoS). The work covers the topics of: basic failure phenomena; indentation fracture; fracture and fractography of structural, electro- and bio-/dental ceramics; fracture of fiber-reinforced composites; fracture of porous and laminated ceramics; defect-strength and microstructure - fracture

toughness relationships; damage mechanisms in nanoceramics; fracture and fractography of multilayered ceramics and coatings; machining cracks and edge-chipping; and fracture and fractography of composites and nanocomposites.

How to Organize and Run a Failure Investigation

Handbook of Materials Failure Analysis: With Case Studies from the Construction Industry provides a thorough understanding of the reasons materials fail in certain situations, covering important scenarios including material defects, mechanical failure due to various causes, and improper material selection and/or corrosive environment. The book begins with a general overview of materials failure analysis and its importance, and then logically proceeds from a discussion of the failure analysis process, types of failure analysis, and specific tools and techniques, to chapters on analysis of materials failure from various causes. Failure can occur for several reasons, including: materials defects-related failure, materials design-related failure, or corrosion-related failures. The suitability of the materials to work in a definite environment is an important issue. The results of these failures can be catastrophic in the worst case scenarios, causing loss of life. This important reference covers the most common types of materials failure, and provides possible solutions. Provides the most up-to-date and balanced coverage of failure analysis, combining foundational knowledge and current research on the latest developments and innovations in the field Offers an ideal accompaniment for those interested in materials forensic investigation, failure of materials, static failure analysis, dynamic failure analysis, and fatigue life prediction Presents compelling new case studies from key industries to demonstrate concepts and to assist users in avoiding costly errors that could result in catastrophic events

ASM Handbook: Failure analysis and prevention

Learning the proper steps for organizing a failure investigation ensures success. Failure investigations cross company functional boundaries and are an integral component of any design or manufacturing business operation. Well-organized and professionally conducted investigations are essential for solving manufacturing problems and assisting in redesigns. This book outlines a proven systematic approach to failure investigation. It explains the relationship between various failure sources (corrosion, for example) and the organization and conduct of the investigation. It provides a learning platform for engineers from all disciplines: materials, design, manufacturing, quality, and management. The examples in this book focus on the definition of and requirements for a professionally performed failure analysis of a physical object or structure. However, many of the concepts have much greater utility than for investigating the failure of physical objects. For example, the book provides guidance in areas such as learning how to define objectives, negotiating the scope of investigation, examining the physical evidence, and applying general problem-solving techniques.

Electronic Materials Handbook

If you are a manufacturing engineer, component designer, a materials failure analyst, or if you have a general interest in the nature and prevention of

engineering failures, you will be interested in the new and substantial revision of ASM Handbook, Volume 11, Failure Analysis and Prevention. The new Volume 11, with a focus on the root causes of failure, describes the principles, practices, and analytical techniques of failure analysis, so that root causes are properly identified and corrected for the ultimate objective of failure prevention. The newly reorganized Volume 11 begins with sections on the general engineering aspects of failure prevention, with coverage on fundamental root causes, materials selection, and the role of design reviews in failure prevention and analysis. Additional sections describe failures related to metals manufacturing operations, and the increasingly important role of life assessment methods in failure prevention. This is followed by a series of additional sections on the failure analysis process, as well as the principles, practices, tools, and techniques used to perform and evaluate failure analysis work, and the causes, mechanisms, appearances, and prevention methodology for the four classic types of failure (fracture, corrosion, wear, distortion). Contents include: Engineering Aspects of Failure and Prevention; Manufacturing Aspects of Failure and Prevention; Structural Life Assessment Methods; Principles and Practice of Failure Analysis; Tools and Techniques in Failure Analysis; Fracture; Corrosion Related Failures; Wear Failures; Distortion.

ASM Handbook

This textbook covers the important steps in conducting a failure analysis, without boring the student to death. A material failure is defined as a part breaking unexpectedly. The part can be metal, plastic, ceramic or glass, and by breaking we mean that there is a fracture face or a damaged surface to examine. Failure analysis is the science of determining how and why the part broke. An accurate failure analysis is key to making a better product. If one does not understand why a part failed, then it is only guesswork as to how to fix it. Failure analysis of materials is a multi-disciplinary field because it requires people skills in asking the right questions, engineering skills in calculating the stresses, and metallurgical skills in understanding the alloys and interpreting the micrographs. The final skill is writing a comprehensive report. These topics and more are covered in this book.

Advanced Materials & Processes

The growing use of polymer composites is leading to increasing demand for fractographic expertise. Fractography is the study of fracture surface morphologies and it gives an insight into damage and failure mechanisms, underpinning the development of physically-based failure criteria. In composites research it provides a crucial link between predictive models and experimental observations. Finally, it is vital for post-mortem analysis of failed or crashed polymer composite components, the findings of which can be used to optimise future designs. Failure analysis and fractography of polymer composites covers the following topics: methodology and tools for failure analysis; fibre-dominated failures; delamination-dominated failures; fatigue failures; the influence of fibre architecture on failure; types of defect and damage; case studies of failures due to overload and design deficiencies; case studies of failures due to material and manufacturing defects; and case studies of failures due to in-service factors. With its distinguished author, Failure analysis and fractography of polymer composites is a standard reference text for researchers working on damage and failure mechanisms in composites,

engineers characterising manufacturing and in-service defects in composite structures, and investigators undertaking post-mortem failure analysis of components. The book is aimed at both academic and industrial users, specifically final year and postgraduate engineering and materials students researching composites and industry designers and engineers in aerospace, civil, marine, power and transport applications. Examines the study of fracture surface morphologies in understanding composite structural behaviour Discusses composites research and post-modern analysis of failed or crashed polymer composite components Provides an overview of damage mechanisms, types of defect and failure criteria

Nalco Guide to Boiler Failure Analysis, 2nd Edition

Practical, up-to-date techniques for identifying and eliminating common causes of boiler failure Filled with more than 200 color images, The Nalco Guide to Boiler Failure Analysis, Second Edition categorizes distinct failure modes that typify nearly all boiler problems and walks you, step by step, through their solutions. Each type of failure is classified according to its location, general description, critical factors, identification, elimination, cautions, and related problems. Real-world case histories are included throughout. This authoritative resource contains new chapters on: Phosphate corrosion Stress-assisted corrosion Steam and condensate damage Flow-accelerated corrosion Comprehensive coverage includes: Water- and steam-formed deposits * Short- and long-term overheating * Caustic corrosion * Low-pH corrosion * Hydrogen damage * Chelant complexing * Oxygen corrosion * Corrosion during cleaning * Corrosion fatigue cracking * Stress corrosion cracking * Graphitic corrosion * Dealloying * Cavitation * Erosion * Waterwall fireside corrosion * High-temperature furnace corrosion * Cold-end corrosion * Dew point corrosion * Fireside corrosion * Welding defects

Handbook of Materials Failure Analysis

Metal Failures

Failure Analysis and Fractography of Polymer Composites

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