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# Diffusion Chromizing Of Alloys

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Heat Treatment  
Superalloys  
NASA technical note  
Coatings for Harsh Environments  
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High Temperature Corrosion  
High Temperature Alloys for Gas Turbines and Other Applications, 1986  
Advances in Surface Treatments  
A Technical Guide, 2nd Edition

### Chromizing of Alloys Encyclopedia of Iron, Steel, and Their Alloys (Online Version)

This book covers virtually all technical aspects related to the selection, processing, use, and analysis of superalloys. The text of this new second edition has been completely revised and expanded with many new figures and tables added. In developing this new edition, the focus has been on providing comprehensive and practical coverage of superalloys technology. Some highlights include the most complete and up-to-date presentation available on alloy melting. Coverage of alloy selection provides many tips and guidelines that the reader can use in identifying an appropriate alloy for a specific application. The relation of properties and microstructure is covered in more detail than in previous books.

#### *Heat Treatment* CRC Press

The first of many important works featured in CRC Press' Metals and Alloys Encyclopedia Collection, the Encyclopedia of Iron, Steel, and Their Alloys covers all the fundamental, theoretical, and application-related aspects of the metallurgical science, engineering, and technology of iron, steel, and their alloys. This Five-Volume Set addresses topics such as extractive metallurgy, powder metallurgy and processing, physical metallurgy, production engineering, corrosion engineering, thermal processing, metalworking, welding, iron- and steelmaking, heat treating, rolling, casting, hot and cold forming, surface finishing and coating, crystallography, metallography, computational metallurgy, metal-matrix composites, intermetallics, nano- and micro-structured metals and alloys, nano- and micro-alloying effects, special steels, and mining. A valuable reference for

materials scientists and engineers, chemists, manufacturers, miners, researchers, and students, this must-have encyclopedia: Provides extensive coverage of properties and recommended practices Includes a wealth of helpful charts, nomograms, and figures Contains cross referencing for quick and easy search Each entry is written by a subject-matter expert and reviewed by an international panel of renowned researchers from academia, government, and industry. Also Available Online This Taylor & Francis

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#### Superalloys ASM International

#### Diffusion Chromizing of

Alloys Encyclopedia of Iron, Steel, and Their Alloys (Online Version) CRC Press  
*NASA technical note* Butterworth-Heinemann

Heat treatment and surface engineering are seen as crucial elements in the design and manufacture of strategic components in a wide range of market sectors and industries including air, sea and land transportation, energy production, mining, defense or agriculture. This book offers a broad review of recent global developments in an application of thermal and thermochemical processing to modify the microstructure and properties of a

wide range of engineering materials. Although there is no formal partition of the book, chapters represent two different application areas of heat treatment. The first group covers the conventional heat treatment with processing of bearing rings, wrought and cast steels, aluminum alloys, fundamentals of thermochemical treatment, details of carbonitriding and a design of cooling units. The second group describes a use of non-conventional thermal routes during manufacturing cycles of such materials as vanadium carbides, titanium dioxide, metallic glasses, superconducting ceramics, nanoparticles, metal oxides, battery materials and slag mortars. A mixture of conventional and novel applications, exploring a variety of processes employing heating, quenching and thermal diffusion, makes the book very useful for a broad audience of scientists and engineers from academia and industry.

#### Coatings for Harsh Environments

Springer Science & Business

An Introduction to Surface Alloying of Metals aims to serve as a primer to the basic aspects of surface alloying of metals. The book serves to elucidate fundamentals of surface modification and their engineering applications. The book starts with basics of surface alloying and goes on to cover key surface alloying methods, such as carburizing, nitriding, chromizing, duplex treatment and the characterization of surface layers. The book will prove useful to students at both the undergraduate and graduate levels, as also to researchers and practitioners looking for a quick introduction to surface alloying.

*Proceedings of the 5th China Aeronautical Science and Technology*

*Conference* Springer Science & Business Media

To sort out the progress of aviation science and technology and industry, look forward to the future development trend, commend scientific and technological innovation achievements and talents, strengthen international cooperation, promote discipline exchanges, encourage scientific and technological innovation, and promote the development of aviation, the Chinese Aeronautical Society holds a China Aviation Science and Technology Conference every two years, which has been successfully held for four times and has become the highest level, largest scale, most influential and authoritative science and technology conference in the field of aviation in China. The 5th China Aviation Science and Technology Conference will be held in Wuzhen, Jiaxing City, Zhejiang Province in 2021, with the theme of "New Generation of Aviation Equipment and Technology", with academician Zhang Yanzhong as the chairman of the conference. This book contains original, peer-reviewed research papers from the conference. The topics covered include but are not limited to navigation, guidance and control technologies, key technologies for aircraft design and overall optimization, aviation test technologies, aviation airborne systems, electromechanical technologies, structural design, aerodynamics and flight mechanics, other related technologies, advanced aviation materials and manufacturing technologies, advanced aviation propulsion technologies, and civil aviation transportation. The papers presented here share the latest discoveries on aviation science and technology, making the book a valuable

asset for researchers, engineers, and students.

### **Metallurgical and Ceramic**

#### **Protective Coatings** CRC Press

This text for graduate and post graduate students covers fundamentals of high temperature corrosion and related topics. Early chapters cover the thermodynamics and kinetics of oxidation and defect structure of oxides and diffusion in oxides, and later chapters cover thin and thick layer oxidation, o

#### *Alloys Index* John Wiley & Sons

One of the most effective methods of increasing the wear resistance, hardness, surface strength and high-temperature oxidation resistance of metals and alloys is the diffusion saturation of the surfaces by metals and nonmetals. For communicating and discussing the results of the numerous researches carried out in this field in the Department of Physical and Technical Problems of Materials Science, Academy of Sciences of the UkrSSR, a permanent Scientific Seminar was set up in 1961, which enjoys an ever-increasing popularity among specialists in this field. The present collection contains papers read at the Third Session of this Seminar, held on September 25-28, 1963. The compilers of the collection and the authors of the papers hope that its publication in the U. S. A. will enable American specialists to become acquainted with the main lines along which corresponding work is being conducted in the USSR. This should contribute to an exchange of scientific experience in this interesting field which is of such great practical importance. G. V. Samsonov

**PREFACE** This collection is comprised of papers relating to the diffusion saturation of metals and to coatings of refractory compounds. The

papers discuss current problems in the theory and practice of the production of diffusion coatings on metallic materials. A means of classifying the methods of diffusion saturation is proposed, and a new method is described for calculating the diffusion parameters in a heterogeneous medium.

#### **Aerospace Materials Handbook** MDPI

Environmental problems derived from the massive use of conventional energy resources are one of the main issues that our society has been facing in recent decades. Renewable energies (and particularly solar energy) have become a highly competitive means to meet the world's increasing energy demands in a sustainable and clean manner. One of the key research challenges for the commercial deployment of several solar energy technologies is focused on the development of feasible and durable coatings that withstand appropriate optical and thermal performance over the lifetime of the solar facilities. This book addresses a number of relevant aspects related to coatings for renewable energies, including a deep survey of coatings used in photovoltaic solar energy, the development of a superhydrophobic and thermal stable silica coating that is potentially suitable for various industrial applications related to renewable technologies, the development of coatings to improve the resistance of structural materials used in concentrating solar thermal technologies with molten salts, and several research works related to solar reflectors for concentrating solar thermal technologies (such as the advanced analysis of the corrosion, the suitability of anti-soiling coatings, and the development of top protective coatings for high-temperature secondary concentrators).

### Technical Data Digest MDPI

Surface engineering is an increasingly important field and consequently those involved need to be aware of the vast range of technologies available to modify surfaces. This text provides an up-to-date, authoritative exposition of the major condensed phase methods used for producing metallurgical and ceramic coatings. Each method is discussed thoroughly by an expert in that field. In each chapter the principle of the method, its range of applications and technical aspects involved are described. The book not only informs the reader about established technologies familiar only to specialists, but also details activity on the frontier of coating technology providing an insight into those potential technologies not yet fully developed but which should emerge in the near future.

### Special Foreign Currency Science Information Program List of Translations in Process Springer Science & Business Media

This book serves as a reference for engineers, scientists, and students concerned with the use of materials in applications where reliability and resistance to corrosion are important. It updates the coverage of its predecessor, including coverage of: corrosion rates of steel in major river systems and atmospheric corrosion rates, the corrosion behavior of materials such as weathering steels and newer stainless alloys, and the corrosion behavior and engineering approaches to corrosion control for nonmetallic materials. New chapters include: high-temperature oxidation of metals and alloys, nanomaterials, and dental materials, anodic protection. Also featured are chapters dealing with standards for corrosion testing, microbiological

corrosion, and electrochemical noise.

### **Consolidated Translation Survey**

CRC Press

This book is a comprehensive guide to the compositions, properties, processing, performance, and applications of nickel, cobalt, and their alloys. It includes all of the essential information contained in the ASM Handbook series, as well as new or updated coverage in many areas in the nickel, cobalt, and related industries.

### **U.S. Government Research Reports**

BoD – Books on Demand

The operation of numerous components that are critical to safety in industries around the world relies on protective coatings. These coatings often allow process equipment to serve a purpose in environments well beyond the operational limit of the uncoated components. Durability, ease of application, repairability, reliability and long-term performance of such coatings are all key to their application.

Therefore, this book, *Coatings for Harsh Environments*, is devoted to research and review articles on the metallic, non-metallic and composite coatings used in aggressive environments. In particular, the topics of interest include, but are not limited to: coatings for high temperature and molten salt applications; thermal spray and cold spray coatings for aggressive environments; corrosion, wear and cavitation resistant coatings; coatings for mitigating marine corrosion; coatings for chemical and petrochemical plants; thermal barrier coatings.

### Nuclear Science Abstracts ASM

International

The 1982 statistics on the use of family planning and infertility services presented in this report are preliminary results from Cycle III of the National Survey of Family Growth (NSFG), conducted by the National Center for

Health Statistics. Data were collected through personal interviews with a multistage area probability sample of 7969 women aged 15-44. A detailed series of questions was asked to obtain relatively complete estimates of the extent and type of family planning services received. Statistics on family planning services are limited to women who were able to conceive 3 years before the interview date. Overall, 79% of currently married nonsterile women reported using some type of family planning service during the previous 3 years. There were no statistically significant differences between white (79%), black (75%) or Hispanic (77%) wives, or between the 2 income groups. The 1982 survey questions were more comprehensive than those of earlier cycles of the survey. The annual rate of visits for family planning services in 1982 was 1077 visits /1000 women. Teenagers had the highest annual visit rate (1581/1000) of any age group for all sources of family planning services combined. Visit rates declined sharply with age from 1447 at ages 15-24 to 479 at ages 35-44. Similar declines with age also were found in the visit rates for white and black women separately. Nevertheless, the annual visit rate for black women (1334/1000) was significantly higher than that for white women (1033). The highest overall visit rate was for black women 15-19 years of age (1867/1000). Nearly 2/3 of all family planning visits were to private medical sources. Teenagers of all races had higher family planning service visit rates to clinics than to private medical sources, as did black women age 15-24. White women age 20 and older had higher visit rates to private medical services than to clinics. Never married women had higher visit rates to clinics

than currently or formerly married women. Data were also collected in 1982 on use of medical services for infertility by women who had difficulty in conceiving or carrying a pregnancy to term. About 1 million ever married women had 1 or more infertility visits in the 12 months before the interview. During the 3 years before interview, about 1.9 million women had infertility visits. For all ever married women, as well as for white and black women separately, infertility services were more likely to be secured from private medical sources than from clinics. The survey design, reliability of the estimates and the terms used are explained in the technical notes.

*An Introduction to Surface Alloying of Metals* Springer Nature

Reviews the science and engineering of high-temperature corrosion and provides guidelines for selecting the best materials for an array of system processes High-temperature corrosion (HTC) is a widespread problem in an array of industries, including power generation, aerospace, automotive, and mineral and chemical processing, to name a few. This book provides engineers, physicists, and chemists with a balanced presentation of all relevant basic science and engineering aspects of high-temperature corrosion. It covers most HTC types, including oxidation, sulfidation, nitridation, molten salts, fuel-ash corrosion, H<sub>2</sub>S/H<sub>2</sub> corrosion, molten fluoride/HF corrosion, and carburization. It also provides corrosion data essential for making the appropriate choices of candidate materials for high-temperature service in process conditions. A form of corrosion that does not require the presence of liquids, high-temperature corrosion occurs due to the interaction at high temperatures of

gases, liquids, or solids with materials. HTC is a subject of increasing importance in many areas of science and engineering, and students, researchers, and engineers need to be aware of the nature of the processes that occur in high-temperature materials and equipment in common use today, especially in the chemical, gas, petroleum, electric power, metal manufacturing, automotive, and nuclear industries. Provides engineers and scientists with the essential data needed to make the most informed decisions on materials selection Includes up-to-date information accompanied by more than 1,000 references, 80% of which from within the past fifteen years Includes details on systems of critical engineering importance, especially the corrosion induced by low-energy radionuclides Includes practical guidelines for testing and research in HTC, along with both the European and International Standards for high-temperature corrosion engineering Offering balanced, in-depth coverage of the fundamental science behind and engineering of HTC, *High Temperature Corrosion: Fundamentals and Engineering* is a valuable resource for academic researchers, students, and professionals in the material sciences, solid state physics, solid state chemistry, electrochemistry, metallurgy, and mechanical, chemical, and structural engineers.

Metals Abstracts ASM International *Advances in Surface Treatments* provides information on technologies, applications, and effects of surface treatment processes on different materials. The text is composed of papers that are presented at the AST World Conference, "Advances in Surface Treatments and Surface Finishing", held in Paris in December 1986. The book is

divided into six parts; each of which discusses a different topic in the field of surface treatment. These topics include thermal and thermochemical surface treatments; mechanical surface treatments and their effects; quality control of surface treated materials; surface finishing; surface coating; laser surface of hardening materials; and the relationship of surface treatment with the environment. Topics such as metallic coatings and special surface treatments are also covered in the book. The text is recommended for engineers who are not yet familiar with surface treatments as well as those who wish to contribute to the research in this field.

Technology — Applications — Effects

John Wiley & Sons

This highly practical reference presents for the first time in a single volume all types of environmental degradation a metallic compound may undergo during its processing, storage, and service. Clarifying general and localized corrosion effects, *Environmental Degradation of Metals* describes the effects of atmospheric exposure, high-temperature gases, soil, water, weak and strong chemicals, liquid metals, and nuclear radiation. It determines whether corrosion can occur under a given set of conditions, shows how improvements in component design can reduce corrosion, and details the high- and low-temperature effects of oxidizing agents. The book also investigates the instantaneous and delayed failure of solid metal in contact with liquid metal, highlights the influence of hydrogen on metal, and profiles radiation effects on metal.

*Corrosion Technology Series/14* Elsevier Effective coatings are essential to counteract the effects of corrosion and degradation of exposed materials in

high-temperature environments such as gas turbine engines. Thermal barrier coatings reviews the latest advances in processing and performance of thermal barrier coatings, as well as their failure mechanisms. Part one reviews the materials and structures of thermal barrier coatings. Chapters cover both metallic and ceramic coating materials as well as nanostructured coatings. Part two covers established and advanced processing and spraying techniques, with chapters on the latest advances in plasma spraying and plasma vapour deposition as well as detonation gun spraying. Part three discusses the performance and failure of thermal barrier coatings, including oxidation and hot-corrosion, non-destructive evaluation and new materials, technologies and processes. With its distinguished editors and international team of contributors, Thermal barrier coatings is an essential reference for professional engineers in such industries as energy production, aerospace and chemical engineering as well as academic researchers in materials. Reviews the latest advances in processing and performance of thermal barrier coatings, as well as their failure mechanisms Explores the materials and structures of thermal barrier coatings incorporating cover both metallic and ceramic coating materials as well as nanostructured coating

Assesses established and advanced processing and spraying techniques, including plasma vapour deposition and detonation gun spraying

Environmental Degradation of Metals  
CRC Press

Whether an airplane or a space shuttle, a flying machine requires advanced materials to provide a strong, lightweight body and a powerful engine that functions at high temperature. The Aerospace Materials Handbook examines these materials, covering traditional superalloys as well as more recently developed light alloys. Capturing state-of-the-art d

**High Temperature Coatings** ASM International

The book has covered the state-of-the-art technologies, development, and research progress of corrosion studies in a wide range of research and application fields. The authors have contributed their chapters on corrosion characterization and corrosion resistance. The applications of corrosion resistance materials will also bring great values to reader's work at different fields. In addition to traditional corrosion study, the book also contains chapters dealing with energy, fuel cell, daily life materials, corrosion study in green materials, and in semiconductor industry.

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