

Online Library Grey Cast Iron
Composition Casting Quality

Grey Cast Iron Composition Casting Quality

*This comprehensive text on
principles and practice of*

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mechanical design discusses the concepts, procedures, data, tools, and analytical methodologies needed to perform design calculations for the most frequently encountered mechanical elements such as

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shafts, gears, belt, rope and chain drives, bearings, springs, joints, couplings, brakes and clutches, flywheels, as well as design calculations of various IC engine parts. The book focuses on all aspects of design of machine

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elements including material selection and life or performance estimation under static, fatigue, impact and creep loading conditions. The book also introduces various engineering analysis tools such as MATLAB,

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AutoCAD, and Finite Element Methods with a view to optimizing the design. It also explains the fracture mechanics based design concept with many practical examples. Pedagogically strong, the book features an abundance of

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worked-out examples, case studies, chapter-end summaries, review questions as well as multiple choice questions which are all well designed to sharpen the learning and design skills of the students. This textbook is

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*designed to appropriately serve
the needs of undergraduate and
postgraduate students of
mechanical engineering,
agricultural engineering, and
production and industrial
engineering for a complete course*

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in Machine Design (Papers I and II), fully conforming to the prescribed syllabi of all universities and institutes.

Metal working fluids (MWFs) provide important functions such as lubrication and cooling in the

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machining of metals. This book reviews the issues surrounding the use of fluids for cutting and grinding throughout the metal working process, from selection and testing to disposal. The book opens with chapters considering

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*the mechanism and action,
selection and delivery of MWFs to
the machining zone before moving
onto discuss the many issues
surrounding MWFs during
machining such as selection of the
proper MWF, environmental*

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concerns, supply methods, circulation and monitoring. The final chapters discuss the maintenance, replacement and disposal of MWFs. With its distinguished editors and international team of expert

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contributors, Metalworking fluids (MWFs) for cutting and grinding is an invaluable reference tool for engineers and organizations using metal cutting/machining in the manufacturing process as well as machine designers/manufacturers

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and machining fluid/chemical suppliers. Chapters consider the mechanism and action, selection and delivery of MWFs to the machining zone Environmental concerns, supply methods, circulation and monitoring are

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*also discussed Written by
distinguished editors and
international team of expert
contributors*

*Materials covered include carbon,
alloy and stainless steels; alloy
cast irons; high-alloy cast steels;*

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superalloys; titanium and titanium alloys; refractory metals and alloys; nickel-chromium and nickel-thoria alloys; structural intermetallics; structural ceramics, cermets, and cemented carbides; and carbon-composites.

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*The Gray Iron Castings Handbook
Including Data on Gray, Ductile,
White, and High Alloy Irons
Foseco Ferrous Foundryman's
Handbook
Typical Microstructures of Cast
Iron*

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*Covering Data on Gray, Malleable,
Ductile, White, Alloy, and
Compacted Graphite Irons
Heat-Resistant Materials*

**Cast iron offers the design
engineer a low-cost, high-
strength material that can be**

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easily cast into a wide variety of useful, and sometimes complex, shapes. This handbook from ASM covers the entire spectrum of one of the most widely used and versatile of all metals.

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The book covers fundamental concepts, description, terminology, force analysis and methods of analysis and design. The emphasis in treating the machine elements is on methods and procedures

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**that give the student
competence in applying these
to mechanical components in
general. The book offers the
students to learn to use the
best available scientific
understanding together with**

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empirical information, good judgement, and often a degree of ingenuity, in order to produce the best product. Few unique articles e.g., chain failure modes, lubrication of chain drive, timing belt

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pulleys, rope lay selection, wire rope manufacturing methods, effect of sheave size etc., are included. Friction materials are discussed in detail for both wet and dry running with the relevant

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charts used in industry.

Design of journal bearing is dealt exhaustively. Salient Features: " Compatible with the Machine Design Data Book (same author and publisher). "
Thorough treatment of the

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**requisite engineering
mechanics topics. " Balance
between analysis and design.
" Emphasis on the materials,
properties and analysis of the
machine element. " Material,
factor of safety and**

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manufacturing method are given for each machine element. " Design steps are given for all important machine elements. " The example design problems and solution techniques are

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spelled out in detail. "

**Objective type, short answer
and review problems are
given at the end of each
chapter. " All the illustrations
are done with the help of
suitable diagrams. " As per**

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Indian Standards.

**Cast Iron: Physical and
Engineering Properties
describes the importance of
iron and its properties, as well
as the process of casting in
the different fields of**

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engineering. The book covers topics such as the mechanical, physical, and electrical properties of iron and the different tests under which it is subjected; the effects of heat treatment on

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gray cast iron; and the resistance of cast iron to heat and stress. Topics also include internal casting stresses; cast iron beams and columns; and the application of the specifications for cast

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iron to design. The text is recommended for metallurgists and engineers who are interested in cast iron, its properties, and its uses in construction.

Factors Affecting the

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**Structure and Properties of
Gray Cast Iron
Facts, Figures and Formulae
Springer Handbook of
Mechanical Engineering
Workshop Practice
Steel and Iron Handbook**

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Cast Irons

Modern civilization as people know it would not be possible without Iron and Steel. Iron has been a vital material in technology for well over three thousand years. However, since

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ancient times, steel is made by alloying iron with carbon to produce a harder, stronger metal that will take a much keener edge. Owing to its intense connections with core infrastructural segments of the

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economy, steel industry is of high priority and importance. Steel has probably the widest range of applications of any material. The wide range of alloy compositions, mechanical properties and product forms

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available make it a versatile material that is used in components and products that may be small or large, high-tech or low-tech, everyday or specialist. In an introduction to modern steel making, an attempt

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has been made to cover, as the space would permit, the entire field of steel making with equal emphasis on the general practices and the underlying principles. This book is intended as a resource and as an

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introduction to the layman about our most important metal system. This book provides basic information covering every aspect of iron and steel production as well as a practical aid for workers engaged in the

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field. After an introduction that deals with the history and production of iron and steel, the rest of the book examines their physical properties and metallurgy. Beginning with a brief introduction to the ferrous alloys

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and metals, types and production of cast iron, production of compacted Graphite Irons, Ductile Iron, Malleable Cast Iron and current status of steel making together with the reasons for obsolescence of Bessemer

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converter and open hearth processes, the book moves on to: elaborate the physiochemical principles involved in steel making; explain the operational principles and practices of the modern processes of primary

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steel making (LD converter, Q-BOP process, and electric arc furnace process); provide a summary of the developments in secondary refining of steels; discuss principles and practices of ingot casting and continuous

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casting of steels; discusses the defects in the steel produced and also the remedies for their removal. This book provides considerable information in an easily assimilable form and makes an ideal introduction to

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the complex subject of steel technology.

The demand for cast iron components, with weights ranging from a few kilograms to several tons, has increased significantly in recent years, both

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for technical and economic reasons. In fact, the lower cost compared to other alloys, and the good castability, which allow one to obtain near-net shape components in as-cast conditions, and the mechanical

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properties that can be obtained, are just some of the motivations that attract mechanical designers. However, correct design requires a good knowledge of the intrinsic correlation among alloy chemical

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composition, process parameters, microstructure (with casting defects) and mechanical properties. This book is aimed at collecting excellent and recent research experimental and theoretical works in this filed.

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Technological (say, wear resistance and weldability) and mechanical properties (say, Young modulus, static and fatigue strength) of different grades of cast irons, ranging from solution strengthened

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ferritic ductile iron to compacted graphite iron as well as white and nodular cast irons, are correlated with the alloy chemical composition, process parameters and casting dimension.

This textbook focuses on cast

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irons, the second material in production and consumption after steel. The authors describe the Fe-C stable and metastable diagrams from the physical-chemical metallurgy point of view. The main properties of cast

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irons are presented and justified for all kinds of cast irons: low cost, excellent castability, mechanical properties depending on the graphite morphology (gray irons) and high wear resistance (white irons). The physical

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metallurgy of highly alloyed cast irons is also described, particularly that one of those used as a consequence of their abrasion, corrosion and heat resistance. The book presents exercises, problems and cases

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studies, with different sections dedicated to the molding practice. The book finishes with the production cast irons in the cupola furnace. This concise textbook is particularly of interest for students and engineers that

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work in industries related to cast
irons.

Founding. Austenitic Cast Irons
ASM Specialty Handbook
Applied Science in the Casting of
Metals
Fundamentals of Modern

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Manufacturing

FUNDAMENTALS AND
APPLICATIONS

Effect of Composition and
Design Factors on the Shrinkage
of Grey Cast Iron

The book comprises three

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parts. Part 1 gives a historical description of the development of ironworking techniques since the earliest times. Part 2 is the core of the book and deals with the metallurgical basis of

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microstructures, with four main themes: phase diagrams, solidification processes, diffusion, and solid state phase transformations. Part 3 begins by an introduction to

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steel design principles. It then goes on to consider the different categories of steels, placing emphasis on their specific microstructural features. Finally, a comprehensive reference list

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includes several hundred pertinent articles and books. The book is the work of a single author, thus ensuring uniformity and concision. It is intended for scientists, metallurgical engineers and

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senior technicians in
research and development
laboratories, design offices
and quality departments, as
well as for teachers and
students in universities,
technical colleges and other

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higher education
establishments.

Austenitic cast-iron, Cast-
iron, Alloy cast-iron, Grey
cast-iron, Spheroidal-
graphite cast-iron, Ferrous
alloys, Grades (quality),

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Castings, Designations,
Chemical composition,
Mechanical properties of
materials

Reflecting the changes that
have occurred in making
castings, this book provides

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a practical reference for all those concerned with making castings in any of the commonly used alloys by any of the usual moulding methods. International SI units, Metric and Imperial

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units are used throughout.

Foseco Foundryman's

Handbook

Physical Metallurgy of Cast
Irons

Proceedings of ICRAM 2020

Fundamentals and Recent

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Advances

Including Data on Gray,
Ductile (nodular), White, and
High Alloy Irons

Comprehensive Basic
Mechanical Engineering

Ferrous materials have made a

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major contribution to the development of modern technology. They span a tremendous range of properties and applications. Part A of this book is dedicated to the fundamental relationships between

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the structure and the properties of ferrous materials. The considerably larger Part B deals with standardised materials, recent developments and industrial applications, which also affect processing aspects. Details are

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given for general engineering materials, tool and functional materials, as well as high-strength, creep-resistant and wear-resistant grades. This book closes the gap in the treatment of steel and cast iron. Each chapter takes into account

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the gradual transitions between the two types of ferrous materials. The authors demonstrate that steel and cast iron are versatile and customisable materials which will continue to play a key role in the future.

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This book deals with various science and technology factors that need careful consideration in producing a casting. It consists of 11 chapters contributed by experts in their respective fields. The topics include simulation of continuous

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casting process, control of solidification of continuous castings, influence of mold flux in continuous casting, segregation in strip casting of steel, developments in shell and solid investment mold processes, innovative pressure

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control during filling of sand
molds, fracture toughness
specifically of castings, permanent
molding of cast iron, wear resistant
castings and improvement of
accuracy in estimating graphite
nodularity in ductile iron castings.

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Cast Iron: Physical and Engineering
Properties Elsevier

A New Song on the Erecting of
O'Connell's Monument for 1882

Cast Iron: Physical and Engineering
Properties

Metalworking Fluids (MWFs) for

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Cutting and Grinding

Gray and Ductile Iron Castings

Handbook

Steel and Cast Iron

Microstructure of Steels and Cast
Irons

This standard specifies the terms and

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definitions of the grey cast iron, grey cast iron designation, technical requirements, sampling requirements, test methods, test rules and casting mark, package and storage and transportation requirements. This standard applies to grey iron castings cast in sand mould or mould with in the

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mold with equal thermal conductivity of sand mould and other grey iron casting cast in other cast moulds can be used as reference.

Engineers rely on Groover because of the book's quantitative and engineering-oriented approach that provides more equations and numerical problem

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exercises. The fourth edition introduces more modern topics, including new materials, processes and systems. End of chapter problems are also thoroughly revised to make the material more relevant. Several figures have been enhanced to significantly improve the quality of artwork. All of these changes

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will help engineers better understand the topic and how to apply it in the field.

This resource covers all areas of interest for the practicing engineer as well as for the student at various levels and educational institutions. It features the work of authors from all over the world

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who have contributed their expertise and support the globally working engineer in finding a solution for today's mechanical engineering problems. Each subject is discussed in detail and supported by numerous figures and tables.

Materials, Processes, and Systems

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**Cast Irons. Materials and Properties
for Design**

Applied Welding Engineering

**Science and Technology of Casting
Processes**

Ductile Iron Handbook

Cupola melting

Cast-iron, Product design,

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Mechanical properties of
materials, Physical
properties of materials,
Chemical composition,
Crystal microstructure,
Selection, Grey cast-iron,
Spheroidal-graphite cast-
iron, Malleable cast-iron,

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Austenitic cast-iron,
Abrasion-resistant materials
More than 30,000 listings
are presented in this
edition with increased
coverage from major steel
producing countries such as
China, India, and Japan.

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This book contains high-quality papers presented in the conference Recent Advances in Mechanical Infrastructure (ICRAM 2020) held at IITRAM, Ahmedabad, India, from 21-23 August 2020. The topics covered in

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this book are recent
advances in thermal
infrastructure,
manufacturing infrastructure
and infrastructure planning
and design.

Analysis and Design of
Machine Elements

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Comprehensive Workshop
Technology (Manufacturing
Processes)

Reclamation of Grey Iron
Machine Swarf by Powder
Metallurgy Technique and
Examination of the Influence
of Composition and

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Processing Parameters on the
Characteristics of the Grey
Cast Iron Powders

Iron Castings Handbook

MACHINE DESIGN

Worldwide Guide to

Equivalent Irons and Steels

Tables and general data;

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Sands and sand bonding systems; Coatings for moulds and cores; Light alloy castings; Copper and copper alloy castings; Iron castings; Die-castings; Steel

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castings; Feeding of
castings; Computer
modelling of
solidification of
castings, the SOLSTAR
system; Filtration of
castings; Principal

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Foseco products.

The revised and updated second edition of this book gives an in-depth presentation of the basic principles and operational procedures

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of general manufacturing processes. It aims at assisting the students in developing an understanding of the important and often complex

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interrelationship among various technical and economical factors involved in manufacturing. The book begins with a discussion on material properties

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while laying emphasis on
the influence of
materials and processing
parameters in
understanding
manufacturing processes
and operations. This is

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followed by a detailed description of various manufacturing processes commonly used in the industry. With several revisions and the addition of four new

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chapters, the new
edition also includes a
detailed discussion on
mechanics of metal
cutting, features and
working of machine
tools, design of molds

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and gating systems for proper filling and cooling of castings.

Besides, the new edition provides the basics of solid-state welding processes, weldability,

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heat in welding,
residual stresses and
testing of weldments and
also of non-conventional
machining methods,
automation and transfer
machining, machining

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centres, robotics,
manufacturing of gears,
threads and jigs and
fixtures. The book is
intended for
undergraduate students
of mechanical

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engineering, production
engineering and
industrial engineering.
The diploma students and
those preparing for
AMIE, Indian Engineering
Services and other

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competitive examinations
will also find the book
highly useful. New to
This Edition : Includes
four new chapters Non-
conventional Machining
Methods; Automation:

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**Transfer Machining,
Machining Centres and
Robotics; Manufacturing
Gears and Threads; and
Jigs and Fixtures to
meet the course
requirements. Offers a**

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good number of worked-out examples to help the students in mastering the concepts of the various manufacturing processes. Provides objective-type questions

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drawn from various
competitive examinations
such as Indian
Engineering Services and
GATE.

Applied Science in the
Casting of Metals

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focuses on metallurgical operations. The book first discusses the manufacture of iron and steel. Concerns include treatment of liquid iron and steel; treatment of

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molten iron between
blast furnace and
steelworks; and
treatment of liquid
steel. The text takes a
look at casting pit
practice, including

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ingot feeding, hot
topping of alloy steels,
methods of applying hot-
tops, and hot-topping
methods. The selection
focuses on spray steel
making and continuous

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casting of steel. The process involved in spray steel making; the basic principles of casting of steel; and metallurgical aspects are discussed. The text

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describes the treatment
of cast iron; treatment
of non-ferrous heavy
metals; treatment of
aluminum and magnesium
alloys; and treatment of
molding sand from molds

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and cores. The book explains the feeding of steel castings. Topics include development of exothermic feeding; mechanisms of alumino-thermic reactions;

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applications of
exothermics to steel
castings; and surface
additions. The text is a
valuable source of data
for readers interested
in metallurgical

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operations.

**Processes, Codes, and
Standards**

**Recent Advances in
Mechanical
Infrastructure**

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**China Standard: GB/T
9439-2010 Grey iron
castings (ISO 185:2005 ,
Grey cast irons-
Classification, MOD)
Properties and
Applications**

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MANUFACTURING PROCESSES

Cast Iron Technology
presents a critical
review of the nature of
cast irons. It discusses
the types of cast iron
and the general purpose

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of cast irons. It also presents the history of the iron founding industry. Some of the topics covered in the book are the description of liquid metal state;

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preparation of liquid
metal; process of
melting; description of
cupola melting and
electric melting
methods; control of
composition of liquid

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metal during
preparation; description
of primary cast iron
solidification
structures; and thermal
analysis of metals to
determine its quality.

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Solidification science and the fundamentals of heat treatment are also discussed. An in-depth analysis of the hot quenching techniques is provided. The

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graphitization potential of liquid iron is well presented. A chapter is devoted to microstructural features of cast iron. The book can provide useful

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information to iron
smiths, welders,
students, and
researchers.

The Foseco Ferrous
Foundryman's Handbook is
a practical reference

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book for all those
concerned with making
castings in any of the
commonly used alloys, by
any of the usual
moulding methods.

International SI units

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are used throughout, but in almost all cases conversions to the more familiar Metric and Imperial units are given. Wherever possible, Casting Alloy

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Specifications include
equivalent
specifications for
several countries as
well as international
specifications.

Individual chapters

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cover the casting of light alloys, copper-based alloys, all types of cast-iron and steel. For each group of alloys, specifications and typical applications

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are described, together with details of melting practice, metal treatment and casting practice. Sand moulding materials, including green sand and

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chemically bonded sands are also included.

While there are several books on market that are designed to serve a company's daily shop-floor needs. Their focus

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is mainly on the
physically making
specific types of welds
on specific types of
materials with specific
welding processes. There
is nearly zero focus on

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the design, maintenance
and troubleshooting of
the welding systems and
equipment. Applied
Welding Engineering:
Processes, Codes and
Standards is designed to

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provide a practical in-
depth instruction for
the selection of the
materials incorporated
in the joint, joint
inspection, and the
quality control for the

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final product. Welding Engineers will also find this book a valuable source for developing new welding processes or procedures for new materials as well as a

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guide for working
closely with design
engineers to develop
efficient welding
designs and fabrication
procedures. Applied
Welding Engineering:

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Processes, Codes and Standards is based on a practical approach. The book's four part treatment starts with a clear and rigorous exposition of the

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science of metallurgy
including but not
limited to: Alloys,
Physical Metallurgy,
Structure of Materials,
Non-Ferrous Materials,
Mechanical Properties

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and Testing of Metals
and Heat Treatment of
Steels. This is followed
by self-contained
sections concerning
applications regarding
Section 2: Welding

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Metallurgy & Welding
Processes, Section 3:
Nondestructive Testing,
and Section 4: Codes and
Standards. The author's
objective is to keep
engineers moored in the

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theory taught in the university and colleges while exploring the real world of practical welding engineering.

Other topics include:
Mechanical Properties

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and Testing of Metals,
Heat Treatment of
Steels, Effect of Heat
on Material During
Welding, Stresses,
Shrinkage and Distortion
in Welding, Welding,

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Corrosion Resistant
Alloys-Stainless Steel,
Welding Defects and
Inspection, Codes,
Specifications and
Standards. The book is
designed to support

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welding and joining
operations where
engineers pass plans and
projects to mid-
management personnel who
must carry out the
planning, organization

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and delivery of
manufacturing projects.
In this book, the author
places emphasis on
developing the skills
needed to lead projects
and interface with

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engineering and development teams. In writing this book, the book leaned heavily on the author's own experience as well as the American Society of

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Mechanical Engineers
(www.asme.org), American
Welding Society
(www.aws.org), American
Society of Metals ([www.a
sminternational.org](http://www.asminternational.org)),
NACE International

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(www.nace.org), American
Petroleum Institute
(www.api.org), etc.
Other sources includes
The Welding Institute,
UK (www.twi.co.uk), and
Indian Air force

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training manuals, ASNT
(www.asnt.org), the
Canadian Standard
Association
(www.cas.com) and
Canadian General
Standard Board (CGSB)

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(www.tpsgc-pwgsc.gc.ca) .
Rules for developing
efficient welding
designs and fabrication
procedures Expert advice
for complying with
international codes and

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standards from the
American Welding
Society, American
Society of Mechanical
Engineers, and The
Welding Institute (UK)
Practical in-depth

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instruction for the selection of the materials incorporated in the joint, joint inspection, and the quality control for the final product.

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Ferrous Materials

operation and

maintenance

Cast Iron Technology