

Elements Of Fuels Furnaces And Refractories By Op Gupta

Furnaces sit at the core of all branches of manufacture and industry, so it is vital that these are designed and operated safely and efficiently. This reference provides all of the furnace theory needed to ensure that this can be executed successfully on an industrial scale.

Industrial and Process Furnaces: Principles, 2nd Edition provides comprehensive coverage of all aspects of furnace operation and design, including topics essential for process engineers and operators to better understand furnaces. This includes: the combustion process and its control, furnace fuels, efficiency, burner design and selection, aerodynamics, heat release profiles, furnace atmosphere, safety and emissions. These elements and more are brought together to illustrate how to achieve optimum design and operation, with real-world case studies to showcase their application. Up-to-date and comprehensive reference encompassing not only best practice of operation but the essential elements of furnace theory and design, essential to anyone working with furnaces, ovens and combustion-based systems. More case studies, more worked examples. New material in this second edition includes further application of Computational Fluid Dynamics (CFD), with additional content on flames and burners, costs, efficiencies and future trends.

Excerpt from Boiler Furnaces The process of combustion is affected by so many different physical conditions that in order to either design a furnace or superintend its

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operation, it is necessary to fully understand the chemical changes which take place. Among the physical conditions referred to above may be included strength of draft, depth of fuel bed, form of furnace, and the various methods of firing employed. So far as the generation of steam is concerned, combustion may be considered as the chemical union of oxygen with the various elements of the fuel for which it has an affinity. This union produces a definite amount of heat per pound of combustible, depending upon the element with which the oxygen combines. The elements contained in the usual forms of fuel, which enter into the process of combustion, are oxygen, carbon, hydrogen and sulphur. There are various other constituents present which have no fuel value, such as the Iron, silicon, etc., found in coal. These usually exist in small quantities, and are classed as impurities. They produce a certain waste in the form of ash, and in addition to this, their temperature must be raised to that of the fire before becoming separated from the other elements, and more or less of this heat is lost as they are discharged from the fire. Oxygen is the universal element of combustion; it is an invisible gas and makes up about one-fifth the volume of the air in an uncombined state. It is also found in water, being combined with hydrogen in this case, and in coal and other fuels of vegetable origin, combined with carbon and hydrogen. It is usually present in coal in amounts varying from 1 to 25 per cent, according to the grade. Carbon is a solid, and is found in a pure state in the form of graphite and charcoal. In its crystallized state it forms diamonds. It is also found in oils of various kinds, and in

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tar, combined with hydrogen. Vegetable products of all kinds contain carbon. In combination with oxygen and hydrogen, and it is the principal heat-producing element in coal and other fuels, including liquids and gases. Hydrogen is a combustible gas, and exists in nature only in combination with some other element. Water can be separated into oxygen and hydrogen by passing a current of electricity through it. Another method of producing the same result is to pass steam through a bed of white-hot coal. The oxygen in this case unites with the carbon, forming carbon monoxide, leaving the hydrogen in a free state. A mixture of carbon monoxide and hydrogen is called water gas and under certain conditions is used for lighting and heating. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works. Written in a student-friendly manner, the book begins with the introduction to fuels, furnaces and refractories. It further exposes the reader to the different types of fuels with their testing methods. Besides covering the recent developments in the

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field of non-recovery coke ovens, dry coke cooling, use of coal in DRI and blast furnace, and new energy recovery system, the book also covers all the aspects of refractory systems. For better understanding of the text, the book includes a large number of illustrations. The book also facilitates a thorough understanding of different environmental issues associated with the use of fuel. Finally, the reader is made familiar with the Indian industrial scenario regarding fuels, furnaces and refractories. Chemical metallurgy is a well founded and fascinating branch of the wide field of metallurgy. This book provides detailed information on both the first steps of separation of desirable minerals and the subsequent mineral processing operations. The complex chemical processes of extracting various elements through hydrometallurgical, pyrometallurgical or electrometallurgical operations are explained. In the choice of material for this work, the author made good use of the synergy of scientific principles and industrial practices, offering the much needed and hitherto unavailable combination of detailed treatises on both compiled in one book. New Scientist magazine was launched in 1956 "for all those men and women who are interested in scientific discovery, and in its industrial, commercial and social consequences". The brand's mission is no different today - for its consumers, New Scientist reports, explores and interprets the results of human

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endeavour set in the context of society and culture.

Elements of Fuels, Furnaces and Refractories
FUELS, FURNACES AND REFRACTORIES
SPHI Learning Pvt. Ltd.

This book contains detailed description of solid, liquid, gaseous fuels, combustion and furnaces. Beside short questions and answers and multiple choice questions & answers and multiple choice questions; answers drawn from the examination papers of various engineering Colleges and professional bodies examinations are also included. The book will be useful for degree & diploma curriculum of various branches of Engineering and for various associate membership examinations conducted by professional bodies like Institution of Engineers (AMIE), Indian Institute of Metals (AMIIM), Indian Institute of Chemical Engineers (AMIChE), Institute of Chemicals etc.

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

Papers of the Symposium on [title] Nov. 1987, Bal Harbor, Fla. detailing the state-of-the-art on residual and unspecified elements in steel from manufacture to end-use. Includes practical examples from industry of beneficial as well as detrimental effects on properties associated with residuals. Pro

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