

1. Record Nr.	UNINA9910816614703321
Autore	Mullinger Peter
Titolo	Industrial and process furnaces : principles, design and operation // Peter Mullinger, Visiting Research Fellow, School of Chemical Engineering, University of Adelaide, South Australia, Barrie Jenkins, Consulting Engineer, High Wycombe, Buckinghamshire, UK
Pubbl/distr/stampa	Oxford : , : Butterworth-Heinemann, , 2014
ISBN	0-08-099378-8
Edizione	[Second edition.]
Descrizione fisica	1 online resource (xxxv, 639 pages) : illustrations
Collana	Gale eBooks
Disciplina	677
Soggetti	Furnaces Furnaces - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Dedication; Industrial and Process Furnaces Principles, Design and Operation; Copyright; Contents; Foreword to Second Edition; Foreword to First Edition; Preface to the Second Edition; Preface to First Edition; Acknowledgements; List of Figures; List of Tables; Chapter 1 - Introduction; 1.1 What is a Furnace?; 1.2 Where are Furnaces Used? Brief Review of Current Furnace Applications and Technology; 1.3 Drivers for Improved Efficiency; 1.4 Concluding Remarks; References; Chapter 2 - The Combustion Process; 2.1 Simple Combustion Chemistry; 2.2 Combustion Calculations 2.3 Chemical Reaction Kinetics2.4 The Physics of Combustion; Nomenclature for Chapter 2; References for Chapter 2; Chapter 3 - Fuels for Furnaces; 3.1 Gaseous Fuels; 3.2 Liquid Fuels; 3.3 Solid Fuels; 3.4 Waste Fuels; 3.5 Choice of Fuel; 3.6 Safety; 3.7 Emissions; References; Solid Fuel Bibliography; Chapter 4 - An Introduction to Heat Transfer in Furnaces; 4.1 Conduction; 4.2 Convection; 4.3 Radiation; 4.4 Electrical Heating; Nomenclature; References; Chapter 5 - Flames and Burners for Furnaces; 5.1 Types of Flame; 5.2 Function of a Burner and Basics of Burner Design; 5.3 Gas Burners 5.4 Oil Burners5.5 Pulverised Coal Burners; 5.6 Furnace Aerodynamics; 5.7 Combustion System Scaling; 5.8 Furnace Noise; Nomenclature for Chapter 5; References for Chapter 5; Chapter 6 - Combustion and Heat

Transfer Modelling; 6.1 Physical Modelling; 6.2 Mathematical Modelling; 6.3 Application of Modelling to Furnace Design; Nomenclature; References; Chapter 7 - Fuel Handling Systems; 7.1 Gas Valve Trains; 7.2 Fuel Oil Handling Systems; 7.3 Pulverised Coal Handling and Firing Systems; 7.4 Waste Fuel Handling; Nomenclature; References for Chapter 7; Applicable Codes and Standards Chapter 8 - Furnace Control and Safety 8.1 Process Control; 8.2 Furnace Instrumentation; 8.3 Flue Gas Analysis; 8.4 Combustion Control; 8.5 Ensuring Furnace Safety; 8.6 Burner Management Systems; Nomenclature; References; Certification and Testing Organisations; Chapter 9 - Furnace Efficiency; 9.1 Furnace Performance Charts; 9.2 Mass and Energy Balances; 9.3 Energy Conversion; 9.4 Heat Recovery Equipment; 9.5 Identifying Efficiency Improvements; Nomenclature for Chapter 9; References; Chapter 10 - Emissions and Environmental Impact; 10.1 Formation of Carbon Monoxide 10.2 Formation of Nitrogen Oxides 10.3 Formation of Sulphur Oxides; 10.4 Formation of Intermediate Combustion Products; 10.5 Particulate Emissions; 10.6 Environmental Control of Emissions; References; Chapter 11 - Furnace Construction and Materials; 11.1 Basic Performance Requirements of the Furnace Structure; 11.2 Basic Construction Methods; 11.3 Practical Engineering Considerations in the Use of Refractories; 11.4 Ceramic Refractory Materials; 11.5 Heat Resisting and Refractory metals; 11.6 Practical Engineering Considerations in the Use of High Temperature Metals; 11.7 Concluding Remarks References

Sommario/riassunto

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, Design and Operation, 2e, provides comprehensive coverage of all aspects of furnace operation and design, including topics essential for process engineers and operators to fully understand furnaces. This includes the combustion process and its control, furnace f
