ISO 13577-1:2016-09 (E)

Industrial furnaces and associated processing equipment - Safety - Part 1: General requirements

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Safety requirements and/or protective measures 2
4.1 General 2
4.1.1 Requirements 2
4.1.2 General design and construction requirements 2
4.2 Mechanical safety 4
4.2.1 General 4
4.2.2 Crushing 5
4.2.3 Shearing 5
4.2.4 Entanglement 5
4.2.5 Drawing-in 5
4.2.6 Impact 5
4.2.7 High-pressure fluid ejection 6
4.2.8 Ejection of parts 6
4.2.9 Slip/trip 6
4.2.10 Falls 6
4.2.11 Transport 6
4.3 Electrical safety 7
4.3.1 Electrical equipment of TPE 7
4.3.2 Electroheat installations/equipment 7
4.4 Thermal and cryogenic safety 8
4.4.1 General 8
4.4.2 Contact with hot/cold surfaces 8
4.4.3 Fire/explosion 8
4.4.4 Ejection of hot particles, work pieces and process liquids 9
4.4.5 Thermal stress and other physiological effects 9
4.5 Noise 10
4.5.1 General 10
4.5.2 Interference with communications 10
4.6 Vibration 10
4.7 Radiation safety 11
4.7.1 General 11
4.7.2 Non-ionizing radiation 11
4.7.3 Ionizing radiation 11
4.8 Materials and substances processed, used or exhausted 12
4.8.1 General 12
4.8.2 Harmful by-products 12
4.8.3 Fire/explosion 12
4.9 Ergonomics 12
4.10 Hazard combination 13
4.11 Malfunction 13
4.11.1 Failure of power supply and auxiliary fluids 13

4.11.2 Errors of fitting/assembly during installation 13
4.11.3 Effect of malfunctions of the control system/component safety devices 13
4.12 Missing and incorrectly fitted safety devices 13
4.12.1 General 13
4.12.2 Power supply disconnection devices 13

5 Verification 14

6 Information for use 16
6.1 General requirements 16
6.2 Location and nature of the information for use 17
6.3 Signals and warning devices 17
6.3.1 General 17
6.3.2 Marking 17
6.3.3 Personnel protection 18
6.3.4 Warning signs 18
6.4 Instruction handbooks/manuals 18

Annex A (informative)Listofsignificanthazards 20

Annex B (informative) List of common industrial furnaces and associatedprocessing equipment29
Annex C (informative) Typical test report 33

Annex D (informative)Work-permitauthorization 35

Annex E (informative)InformationspecifictoJapan 37

Annex F (informative)RequirementsspecifictotheUSA 38

Annex G (informative)RequirementsspecifictotheEUandassociatedcountries 40

Annex H (informative)RequirementsspecifictoCanada 42

Annex I (informative)RequirementsspecifictoChina 43

Bibliography 44