ISO 27831-1:2008-10 (E)

Metallic and other inorganic coatings - Cleaning and preparation of metal surfaces - Part 1: Ferrous metals and alloys

Contents

Page

Foreword vi

Introduction vii

1 Scope 1

2 Normative references 2

3 Terms and definitions 2

4 Essential information to be supplied by the purchaser to the processor 3

5 Requirements 3

6 Standard cleaning methods 4

7 Non-corrosion-resisting steels, cast irons and pure irons 5
7.1 Non-corrosion-resisting steels 5
7.1.1 Selection of method of cleaning 5
7.1.2 Stress relief heat treatment 5
7.1.3 General degreasing and cleaning 5
7.1.3.1 Steels of tensile strength up to 1 000 MPa 5
7.1.3.2 Steels of tensile strength in the range 1 000 MPa to 1 400 MPa 5
7.1.3.3 Steels of tensile strength in the range 1 400 MPa to 1 800 MPa 5
7.1.3.4 Steels of tensile strength over 1 800 MPa 6
7.1.4 Preparation prior to electroplating 6
7.1.5 Preparation prior to autocatalytic nickel plating 7
7.1.6 Preparation prior to phosphate treatment 7
7.1.7 Preparation prior to sherardizing 7
7.1.8 Preparation prior to hot-dip galvanizing 8
7.1.8.1 Steel items other than castings 8
7.1.8.2 Steel castings 8
7.1.9 Preparation prior to metal spraying 8
7.1.9.1 Spraying for protection against corrosion and high-temperature oxidation 8
7.1.9.2 Spraying for reclamation (recycling) purposes 8
7.1.10 Preparation prior to the application of diffusion coatings 8
7.1.11 Preparation prior to vitreous enamelling 9
7.1.11.1 Conventional enamelling method 9
7.1.11.2 Alternative enamelling method 9
7.1.12 Preparation prior to hot tinning 10
7.1.12.1 Preparation for ordinary mild-steel surfaces 10
7.1.12.2 Preparation of non-reactive mild-steel surfaces (TRI process) 10
7.1.13 Preparation prior to physical vapour deposition of cadmium and aluminium 10
7.2 Cast irons 10
7.2.1 General degreasing and cleaning 10
7.2.2 Preparation prior to electroplating 10
7.2.3 Preparation prior to autocatalytic nickel plating 10
7.2.4 Preparation prior to phosphating and the application of other conversion coatings 10
7.2.5 Preparation prior to hot tinning 11
7.2.5.1 "Direct chloride" method (TRI process) 11
7.2.5.2 Preparation prior to electroplating with a readily tin-platable metal 11

7.2.6 Preparation prior to hot-dip galvanizing 11
7.2.7 Preparation prior to metal spraying 11
7.2.8 Preparation prior to diffusion coating 12
7.2.9 Preparation prior to vitreous enamelling 12

8 Corrosion-resisting and heat-resisting steels 12
8.1 Corrosion-resisting steels 12
8.1.1 Stress-relieving heat treatment 12
8.1.2 General degreasing and cleaning 12
8.1.3 Preparation prior to electroplating 12
8.1.4 Preparation prior to autocatalytic nickel plating 12
8.1.5 Preparation prior to metal spraying 12
8.1.5.1 Preparation for metal spraying 12
8.1.5.2 Spraying for reclamation (recycling) purposes 13
8.1.6 Preparation prior to vitreous enamelling -- Austenitic steels 13
8.2 Heat-resisting steels 13

9 Pretreatment of metals prior to powder coating 14
9.1 General degreasing and cleaning 14
9.2 Preparation of non-corrosion-resisting steels 14
9.3 Preparation of corrosion-resisting steels 14

10 Cleaning and preparation processes 14
10.1 Process A -- Organic-solvent degreasing and cleaning 14
10.1.1 General 14
10.1.2 Method A1 -- Hot solvent, not water-rinsable 15
10.1.3 Method A2 -- Cold solvent, not water-rinsable 15
10.1.4 Method A3 -- Hot solvent, water-rinsable 15
10.1.5 Method A4 -- Cold solvent, water-rinsable 15
10.1.6 Method A5 -- Petroleum fuel based mixtures containing emulsifying agents 15
10.1.7 Method A6 -- Ultrasonic cleaning 16
10.2 Process B -- Alkaline degreasing 16
10.2.1 General 16
10.2.2 Method B1 -- General-purpose alkaline degreasing 16
10.2.3 Method B2 -- Mild alkaline degreasing 16
10.2.4 Method B3 -- Cathodic alkaline degreasing 16
10.3 Process C -- Acid emulsion cleaning 16
10.4 Process D -- Abrasive cleaning 17
10.4.1 General 17
10.4.2 Method D1 -- Coarse-abrasive blasting 17
10.4.3 Method D2 -- Fine-abrasive blasting 17
10.4.4 Method D3 -- Scouring 17
10.4.5 Method D4 -- Tumbling 17
10.4.6 Method D5 -- Wire brushing 17
10.5 Process E -- Caustic-alkali descaling 18
10.5.1 Method E1 -- Sodium hydride descaling 18
10.5.2 Method E2 -- Alkali permanganate descaling 18
10.6 Process F -- Acid pickling without electrolysis 18
10.6.1 General 18
10.6.2 Method F1 18
10.6.3 Method F2 18
10.6.4 Method F3 18
10.6.5 Method F4 19
10.6.6 Method F5 19
10.7 Process G -- Acid dipping 19
10.7.1 General 19
10.7.2 Method G1 19
10.7.3 Method G2 19
10.8 Process H -- Anodic pickling 20
10.8.1 General 20
10.8.2 Method H1 20
10.8.3 Method H2 20

10.8.4 Method H3 20
10.9 Process J -- Acid de-rusting 20
10.10 Process K -- Alkaline de-rusting 21
10.10.1 General 21
10.10.2 Method K1 (for light rust) 21
10.10.3 Method K2 (for heavy rust) 21
10.10.4 Method K3 (for heavy rust) 22
10.11 Process L -- Chemical smoothing and electropolishing of steels 22
10.11.1 Method L1 -- Chemical smoothing process (for non-corrosion-resisting steels) 22
10.11.2 Method L2 -- Electropolishing of corrosion-resisting steels 22
10.12 Process M -- Passivation and removal of surface contamination from corrosion-resisting steels and surface preparation prior to electroplating 23
10.12.1 Method M1 -- Passivation 23
10.12.2 Method M2 -- Test for surface contamination 23
10.12.3 Method M3 -- Alternative test for surface contamination 23
10.12.4 Method M4 -- Preparation of corrosion-resisting steels prior to electroplating 24

Annex A (informative) Maintenance of organic and vapour degreasing baths 25

Annex B (informative) The control of acidity in vapour cleaning baths 26

Annex C (normative) Method for the determination of oxidizable material in sulfuric acid 27

Bibliography 28