DIN EN 10253-4:2025-10 (E)

Butt-welding pipe fittings - Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements

Contents

Page

European foreword 5

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms and definitions 11

4 Symbols and abbreviations 12

5 Classification and designation 13
5.1 Classification of grades 13
5.2 Designation of steel grades 13
5.3 Designation of fittings 13
5.3.1 General 13
5.3.2 Elbows and return bends 13
5.3.3 Reducers 13
5.3.4 Tees 14
5.3.5 Caps and dished ends 14

6 Information to be supplied 14
6.1 Mandatory information 14
6.2 Options 14
6.3 Examples of an order 16
6.3.1 Example 1 16
6.3.2 Example 2 16
6.3.3 Example 3 16
6.3.4 Example 4 16
6.3.5 Example 5 16
6.3.6 Example 6 17
6.3.7 Example 7 17

7 Resistance to internal pressure 17
7.1 General 17
7.2 Fittings of type A 17
7.3 Fittings of type B 17

8 Manufacturing process 18
8.1 Steelmaking process 18
8.2 Product making process for fittings and heat treatment 18
8.2.1 Product making process 18
8.2.2 Welding 19
8.2.3 Heat treatment condition 20

9 Technical requirements 20
9.1 General 20
9.2 Chemical composition 20
9.2.1 Cast analysis 20
9.2.2 Product analysis 20

9.3 Mechanical properties 24
9.3.1 At room temperature 24
9.3.2 At elevated temperature 24
9.3.3 At low temperature 24
9.4 Weldability 29
9.5 Corrosion resistance 29

10 Appearance and internal soundness (delivery conditions) 29
10.1 Definition of surface imperfections 29
10.2 Appearance 30
10.3 Internal soundness 31

11 Dimensions and tolerances 31
11.1 Dimensions 31
11.1.1 General 31
11.1.2 Elbows 31
11.1.3 Tees 32
11.1.4 Reducers 33
11.1.5 Caps and dished ends 34
11.1.6 Preferred diameters and wall thicknesses 35
11.2 Dimensional tolerances 35
11.2.1 Diameter 35
11.2.2 Out of roundness 35
11.2.3 Wall thickness tolerances 36
11.2.4 Tolerances on specific dimensions and form 36
11.2.5 Corrugation 37
11.3 Performance of the end bevelling 38

12 Inspection 38
12.1 Type of inspection 38
12.2 Inspection documents 39
12.2.1 Type of inspection documents 39
12.2.2 Content of inspection documents 39
12.3 Summary of inspection and testing 40

13 Sampling 42
13.1 Frequency of tests 42
13.1.1 Test unit 42
13.1.2 Number of test pieces per test unit 44
13.2 Preparation of samples and test pieces 44
13.2.1 Samples for product analysis 44
13.2.2 Samples and test pieces for mechanical tests 44
13.2.3 Test piece for the tensile test on the base material 44
13.2.4 Test piece for the tensile test transverse to the weld 44
13.2.5 Test piece for the weld bend test 44
13.2.6 Test piece for the impact test 44
13.2.7 Test piece for the intergranular corrosion test 45

14 Test methods 45
14.1 Chemical analysis 45
14.2 Tensile test on the base material 45
14.2.1 At room temperature 45
14.2.2 At elevated temperature 45
14.3 Transverse tensile test on the weld 45
14.4 Ring expansion 46
14.5 Weld bend test 46
14.6 Impact testing 46
14.7 Dimensional testing 47
14.8 Visual testing (VT) 47
14.9 Non-destructive testing (NDT) 47
14.9.1 Personnel 47
14.9.2 NDT of the weld 47

14.9.3 Intergranular corrosion test 48
14.9.4 NDT for the detection of laminar imperfections 48
14.9.5 NDT for the detection of longitudinal imperfections 48
14.9.6 NDT for the detection of transverse imperfections 48
14.9.7 NDT of bars and forgings 48
14.9.8 Technological test of weld 48
14.10 Positive material identification (PMI) 49

15 Marking 49

16 Protection and packaging 50

Annex A (normative) Dimensions 51

Annex B (normative) Determination of pressure factors and wall thickness 72

Annex C (normative) Pressure factor Tables for fittings of type A 96

Annex D (informative) Wall thickness tables for fittings of type B 114

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Directive 2014/68/EU aimed to be covered 137

Bibliography 138