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Rørformstykker – Del 2: Ulegerede stål og ferritisk legeret stål med specifikke inspektionskrav

Butt-welding pipe fittings – Part 2: Non alloy and ferritic
alloy steels with specific inspection requirements



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Butt-welding pipe fittings - Part 2: Non alloy and ferritic alloy steels with specific inspection requirements

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Formstücke zum Einschweißen - Teil 2: Unlegierte und legierte ferritische Stähle mit besonderen Prüfanforderungen

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Contents	Page
European foreword.....	6
Introduction	8
1 Scope.....	9
2 Normative references.....	9
3 Terms and definitions	13
4 Symbols and abbreviations	14
5 Classification and designation.....	15
5.1 Classification of grades	15
5.2 Designation of steel grades.....	15
5.3 Designation of fittings	15
5.3.1 General.....	15
5.3.2 Elbows and return bends	15
5.3.3 Reducers.....	16
5.3.4 Tees	16
5.3.5 Caps.....	16
6 Information to be supplied A1 <i>deleted text</i> A1	16
6.1 Mandatory information	16
6.2 Options.....	17
6.3 Examples of an order	18
6.3.1 Example 1.....	18
6.3.2 Example 2.....	18
6.3.3 A1 Example 3 A1	18
6.3.4 A1 Example 4 A1	18
6.3.5 A1 Example 5 A1	18
6.3.6 A1 Example 6 A1	19
7 Resistance to internal pressure	19
7.1 General.....	19
7.2 Fittings of type A.....	19
7.3 Fittings of type B.....	19
8 Manufacturing process.....	19
8.1 Steelmaking process	19
8.2 Product making process for fittings and heat treatment	19
8.2.1 Product making process	19
8.2.2 Welding.....	21
8.2.3 Heat treatment condition.....	21
9 Technical requirements.....	23
9.1 General.....	23
9.2 Chemical composition	23
9.2.1 Cast analysis.....	23
9.2.2 Product analysis	23
9.3 Mechanical properties.....	28
9.4 Creep rupture strength values	37
9.5 Weldability	37

This is a preview of DS/EN 10253-2:2021+A1:2025. [Click here to purchase the full version from the ANSI store.](#)

10	Appearance and internal soundness (delivery conditions)	37
10.1	Definitions of surface imperfections	37
10.2	Appearance	39
10.3	Internal soundness	39
11	Dimensions and tolerances	39
11.1	Dimensions	39
11.1.1	General	39
11.1.2	Elbows	40
11.1.3	Tees	40
11.1.4	Reducers	41
11.1.5	Caps	42
11.1.6	Preferred diameters and wall thicknesses	42
11.2	Dimensional tolerances	44
11.2.1	Diameter	44
11.2.2	Out of roundness	44
11.2.3	Wall thickness tolerances	45
11.2.4	Tolerances on specific dimensions and form	45
11.2.5	Corrugation	46
11.3	Performance of the end bevelling	47
12	Inspection	48
12.1	Type of inspection	48
12.2	Inspection documents	48
12.2.1	Type of inspection documents	48
12.2.2	Content of inspection documents	48
12.3	Summary of inspection and testing	49
13	Sampling	50
13.1	Frequency of tests	50
13.1.1	Test unit	50
13.1.2	Number of test pieces per test unit	52
13.2	Preparation of samples and test pieces	52
13.2.1	Samples for product analysis	52
13.2.2	Samples and test pieces for mechanical tests	52
13.2.3	Test piece for the tensile test on the base material	52
13.2.4	Test piece for the tensile test transverse to the weld	52
13.2.5	Test piece for the weld bend test	52
13.2.6	Test piece for the impact test	53
14	Test methods	53
14.1	Chemical analysis	53
14.2	Tensile test on the base material	53
14.2.1	At room temperature	53
14.2.2	At elevated temperature	54
14.3	Transverse tensile test on the weld	54
14.4	Hardness test	54
14.5	Weld bend test	54
14.6	Impact testing	54
14.7	Dimensional testing	55
14.8	Visual testing (VT)	55
14.9	Non-destructive testing (NDT)	55
14.9.1	Personnel	55
14.9.2	NDT of the weld	56
14.9.3	NDT of cold formed tees	56

This is a preview of DS/EN 10253-2:2021+A1:2025. [Click here to purchase the full version from the ANSI store.](#)

14.9.4	NDT for the detection of laminar imperfections.....	56
14.9.5	NDT for the detection of longitudinal imperfections.....	57
14.9.6	NDT for the detection of transverse imperfections.....	57
14.9.7	NDT of bars and forgings.....	57
14.10	Positive material identification (PMI).....	57
15	Marking.....	57
16	Protection and packaging.....	58
Annex A (normative) Dimensions.....		59
A.1	General.....	59
A.2	Elbows.....	59
A.3	Tees.....	61
A.4	Reducers.....	63
A.5	Caps.....	65
Annex B (normative) Determination of pressure factors and wall thickness.....		67
B.1	General.....	67
B.2	Symbols and units.....	67
B.3	Minimal and nominal wall thickness.....	70
B.4	Pressure factors of fittings of type A.....	70
B.4.1	General.....	70
B.4.2	Pressure factor.....	70
B.4.3	Elbows.....	71
B.4.4	Tees.....	71
B.4.5	Reducers.....	74
B.4.6	Caps.....	79
B.5	Wall thicknesses of fittings of type B.....	81
B.5.1	General.....	81
B.5.2	Elbows.....	81
B.5.3	Tees.....	82
B.5.4	Reducers.....	85
B.5.5	Caps.....	89
Annex C (normative) Pressure factor tables for Fittings of type A.....		91
C.1	General.....	91
C.2	Elbows.....	91
C.3	Tees.....	94
C.4	Reducers.....	102
C.5	Caps.....	111
Annex D (informative) Wall thickness tables for fittings of type B.....		112
D.1	General.....	112

This is a preview of DS/EN 10253-2:2021+A1:2025. [Click here to purchase the full version from the ANSI store.](#)

D.2	Elbows	112
D.3	Tees	115
D.4	Reducers	126
D.5	Caps	141
Annex E (informative)	Recommended heat treatment temperatures	142
Annex F (informative)	Creep rupture strength values	143
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2014/68/EU	149
Bibliography		150

This is a preview of DS/EN 10253-2:2021+A1:2025. [Click here to purchase the full version from the ANSI store.](#)

European foreword

This document (EN 10253-2:2021+A1:2025) has been prepared by Technical Committee CEN/TC 459 “ECISS - European Committee for Iron and Steel Standardization”¹, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2026, and conflicting national standards shall be withdrawn at the latest by June 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes [EN 10253-2:2021](#).

The main changes compared to the previous edition EN 10253-2:2007 are listed below:

- a) Document technically and editorially revised;
- b) Updating of Clause 2 “Normative References”;
- c) Revision of chemical composition and steel grades;
- d) Revision of permissible deviations of the product analysis from specified limits on cast analysis;
- e) Revision of mechanical properties;
- f) Revision of minimum proof strength including minimum wall thickness;
- g) Revision of impact properties including minimum requirements;
- h) Revision of fitting dimensions and moving to new Annex A;
- i) Addition of creep rupture strength values;
- j) Revision of inspection and tests;
- k) Revision of pressure factors;
- l) Updating of Annex ZA to follow new EU Directive 2014/68/EU for pressure equipment;
- m) Updating of the Bibliography.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

¹ Through its sub-committee CEN/TC 459/SC 10 “Steel tubes, and iron and steel fittings” (secretariat: UNI).

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EN 10253 comprises a series of European Standards about *Butt-welding pipe fittings*, namely:

- *Part 1: Wrought carbon steel for general use and without specific inspection requirements;*
- *Part 2: Non alloy and ferritic alloy steels with specific inspection requirements;*
- *Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements;*
- *Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements.*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

In writing this document the competent committee recognized that there are two broad types of products commonly used, and decided to reflect these in the standard by differentiating between two parts.

EN 10253-1 describes fittings without formal reference to the pressure resistance, which are not intended to be used in applications, covered by the Pressure Equipment Directive (2014/68/EU) categories I to IV.

EN 10253-2 defines two types of fittings: Type A fittings have the same wall thickness at the welding ends and at the body of the fitting as a pipe having the same specified wall thickness. Their resistance to internal pressure is, in general, less than that of a straight pipe with the same dimensions. Type B fittings showing increased wall thickness at the body of the fitting are designed to resist the same internal pressure as a straight pipe with same dimensions. These two types of fittings are intended to be used in applications covered by the EU Directive 2014/68/EU. According to this Directive and further interpretation guidelines (e.g. guideline G – 19), seamless fittings are considered as materials whereas welded fittings are considered as components. Therefore, in some areas of this document, provisions for seamless and welded fittings are different.

The selection of steel type and requirement level depend on many factors; the properties of the fluid to be conveyed, the service conditions, the design code and any statutory requirements should all be taken into consideration. Therefore this document gives no detailed guidelines for the application of different fittings. It is the ultimate responsibility of the user to select the appropriate fitting for the intended application.

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1 Scope

This document specifies the technical delivery requirements for seamless and welded butt-welding fittings (elbows, concentric and eccentric reducers, equal and reducing tees, caps) made of carbon and alloy steel in two test-categories which are intended for pressure purposes at room temperature, at low temperature or at elevated temperatures, and for the transmission and distribution of fluids and gases.

It specifies:

- a) type of fittings;
 - type A: Butt-welding fittings with reduced pressure factor;
 - type B: Butt-welding fittings for use at full service pressure;
- b) steel grades and their chemical compositions;
- c) mechanical properties;
- d) dimensions and tolerances;
- e) requirements for inspection and testing;
- f) inspection documents;
- g) marking;
- h) protection and packaging.

NOTE The selection of the appropriate fitting (material, thickness) is the ultimate responsibility of the manufacturer of the pressure equipment (see European Legislation for Pressure Equipment). In the case of a harmonized supporting standard for materials, presumption of conformity to the ESRs is limited to technical data of materials in the standard and does not presume adequacy of the material to a specific item of equipment. Consequently, it is essential that the technical data stated in the material standard be assessed against the design requirements of this specific item of equipment to verify that the ESRs of the PED are satisfied.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10020:2000, *Definition and classification of grades of steel*

EN 10021:2006, *General technical delivery conditions for steel products*

EN 10027-1:2016, *Designation systems for steels — Part 1: Steel names*

EN 10027-2:2015, *Designation systems for steels — Part 2: Numerical system*

EN 10028-2:2017, *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10028-3:2017, *Flat products made of steels for pressure purposes — Part 3: Weldable fine grain steels, normalized*

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EN 10028-4:2017, *Flat products made of steels for pressure purposes — Part 4: Nickel alloy steels with specified low temperature properties*

EN 10160:1999, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)*

EN 10168:2004, *Steel products — Inspection documents — List of information and description*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 10217-1:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties*

EN 10217-2:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*


EN 10217-3:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties*

EN 10217-4:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 4: Electric welded non-alloy steel tubes with specified low temperature properties*


EN 10217-5:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-6:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties*

EN 10220:2002, *Seamless and welded steel tubes — Dimensions and masses per unit length*

EN 10222-2:2017+A1:2021, *Steel forgings for pressure purposes — Part 2: Ferritic and martensitic steels with specified elevated temperatures properties* 

EN 10222-3:2017, *Steel forgings for pressure purposes — Part 3: Nickel steels with specified low temperature properties*


EN 10222-4:2017+A1:2021, *Steel forgings for pressure purposes — Part 4: Weldable fine grain steels with high proof strength* 

EN 10228-3:2016, *Non-destructive testing of steel forgings — Part 3: Ultrasonic testing of ferritic or martensitic steel forgings*

EN 10266:2003, *Steel tubes, fittings and structural hollow sections — Symbols and definitions of terms for use in product standards*

EN 10273:2016, *Hot rolled weldable steel bars for pressure purposes with specified elevated temperature properties*

EN 13480-2:2024, *Metallic industrial piping — Part 2: Materials* 

EN 13480-3:2024, *Metallic industrial piping — Part 3: Design and calculation* 

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A1 EN 13480-5:2024, *Metallic industrial piping — Part 5: Inspection and testing* **A1**

EN ISO 148-1:2016, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2016)*

EN ISO 377:2017, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377:2017)*

A1 EN ISO 2566-1:2021, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:2021, Corrected version 2022-06)* **A1**

EN ISO 3166-1:2020, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code (ISO 3166-1:2020)*

EN ISO 3183:2019, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems (ISO 3183:2019)*

A1 EN ISO 4136:2022, *Destructive tests on welds in metallic materials — Transverse tensile test (ISO 4136:2022)* **A1**

EN ISO 4885:2018, *Ferrous materials — Heat treatments — Vocabulary (ISO 4885:2018)*

A1 EN ISO 5173:2023, *Destructive tests on welds in metallic materials — Bend tests (ISO 5173:2023)* **A1**

A1 EN ISO 5817:2023, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections (ISO 5817:2023)* **A1**

EN ISO 6506-1:2014, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2014)*

EN ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2019)*

EN ISO 6892-2:2018, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature (ISO 6892-2:2018)*

A1 EN ISO 9016:2022, *Destructive tests on welds in metallic materials — Impact tests — Test specimen location, notch orientation and examination (ISO 9016:2022)* **A1**

EN ISO 9606-1:2017, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

A1 EN ISO 9712:2022, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712:2021)* **A1**

EN ISO 10893-3:2011,² *Non-destructive testing of steel tubes — Part 3: Automated full peripheral flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal and/or transverse imperfections (ISO 10893-3:2011)*

EN ISO 10893-4:2011, *Non-destructive testing of steel tubes — Part 4: Liquid penetrant inspection of seamless and welded steel tubes for the detection of surface imperfections (ISO 10893-4:2011)*

² As impacted by EN ISO 10893-3:2011/A1:2019 and EN ISO 10893-3:2011/A2:2020.

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EN ISO 10893-5:2011, *Non-destructive testing of steel tubes — Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections (ISO 10893-5:2011)*

EN ISO 10893-8:2011,³ *Non-destructive testing of steel tubes — Part 8: Automated ultrasonic testing of seamless and welded steel tubes for the detection of laminar imperfections (ISO 10893-8:2011)*

EN ISO 10893-10:2011,⁴ *Non-destructive testing of steel tubes — Part 10: Automated full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transverse imperfections (ISO 10893-10:2011)*

EN ISO 10893-11:2011,⁵ *Non-destructive testing of steel tubes — Part 11: Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections (ISO 10893-11:2011)*

A1 EN ISO 14284:2022, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284:2022)* **A1**

EN ISO 14732:2013, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials (ISO 14732:2013)*

A1 *deleted text* **A1**

EN ISO 15614-1:2017, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2017, Corrected version 2017-10-01)*

EN ISO 17640:2018, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment (ISO 17640:2018)*

EN ISO 18265:2013, *Metallic materials — Conversion of hardness values (ISO 18265:2013)*

³ As impacted by EN ISO 10893-8:2011/A1:2020.

⁴ As impacted by EN ISO 10893-10:2011/A1:2020.

⁵ As impacted by EN ISO 10893-11:2011/A1:2020.

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020:2000, EN 10021:2006, EN ISO 377:2017 and EN ISO 4885:2018 and the following apply

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

employer

organization for which a person works on a regular basis

Note 1 to entry: The employer may be either the fitting manufacturer or supplier or a third party organization providing a service, e.g. NDT.

3.2

model

designation for elbows, return bends and reducers

Note 1 to entry: For elbows and return bends the model defines the bending diameter of the piece.

Note 2 to entry: For reducers the model defines concentric or eccentric shape of the piece.

3.3

purchaser

person or organization that orders products in accordance with this European Standard

Note 1 to entry: The purchaser is not necessarily, but may be, a manufacturer of pressure equipment in accordance with the EU Directive listed in Annex ZA.

Note 2 to entry: Where a purchaser has responsibilities under this EU Directive, this standard will provide a presumption of conformity with the essential requirements of the EU Directive so identified in Annex ZA.

3.4

weld during manufacture

weld made for obtaining a fitting

Note 1 to entry: This term does not include the tube welds when a tube is used as starting material.

3.5

seamless fitting

fitting manufactured without welding from starting material which is not welded

3.6

welded fitting

fitting made from welded starting material or fitting where welding is a part of the manufacturing process

3.7

test category

classification that indicates their extent and level of inspection and testing