SLOVENSKI STANDARD
SIST EN 10253-3:2026

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Cevni fitingi za soležne zvare - 3. del: Kovna avstenitna in avstenitno-feritna (dupleksna) nerjavna jekla brez posebnih zahtev za preglede

Butt-welding pipe fittings - Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements

Formstücke zum Einschweißen - Teil 3: Austenitische und austenitisch-ferritische (Duplex) nichtrostende Stähle ohne besondere Prüfanforderungen

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Raccords à souder bout à bout - Partie 3 : Aciers inoxydables austénitiques et austéno-ferritiques (duplex) sans contrôle spécifique

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ICS:

23.040.40	Kovinski fitingi	Metal fittings
77.140.20	Visokokakovostna jekla	Stainless steels

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EUROPEAN STANDARD
NORME EUROPÉENNE
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Butt-welding pipe fittings - Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements

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European foreword

This document (EN 10253-3:2026) 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of an identical text or by endorsement, at the latest by April 2027, and conflicting national standards shall be withdrawn at the latest by April 2027.

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 10253-3:2008.

This document includes the following significant technical changes with respect to EN 10253-3:2008:

a) clarified different models of reducers and tees;

b) update of technical requirements and dimensions to reflect current state of the art;

c) changed option 3;

d) revision of figures;

e) update of normative references;

f) introduction of metric dimensions tables;

g) removed footnote a) and b) from Table 11, since they did not add any further information.

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

EN 10253, Butt-welding pipe fittings is currently composed with the following parts:

— *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;*

A list of all parts in this series can be found on the CEN website: www.cencenelec.eu.

[1] Through its sub-committee SC 10 “Steel tubes, and iron and steel fittings” (secretariat: UNI).

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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 10253-3 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) in categories I to IV.

EN 10253-4 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 gives no detailed guidelines for the application of different parts. It is the ultimate responsibility of the user to select the appropriate part 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 austenitic and austenitic-ferritic (duplex) stainless steel without specific inspection requirements.

This document specifies:

— steel grades and their chemical compositions;

— mechanical properties;

— dimensions and tolerances;

— requirements for inspection and testing;

— inspection documents;

— marking;

— handling and packaging.

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.

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

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

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

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

EN 10028-7:2016, *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

EN 10079, *Definition of steel products*

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

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

EN 10216-5:2021, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 5: Stainless steel tubes*

EN 10217-7:2021, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 7: Stainless steel tubes*

EN 10222-5:2017, *Steel forgings for pressure purposes — Part 5: Martensitic, austenitic and austenitic-ferritic stainless steels*

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

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EN 10272:2016, *Stainless steel bars for pressure purposes*

EN 10296-2, *Welded circular steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 2: Stainless steel*

EN 10297-2, *Seamless circular steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 2: Stainless steel*

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

EN ISO 2566-2, *Steel — Conversion of elongation values — Part 2: Austenitic steels (ISO 2566-2)*

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

EN ISO 3651-2:1998, *Determination of resistance to intergranular corrosion of stainless steels — Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in media containing sulfuric acid (ISO 3651-2:1998)*

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

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

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

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

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

EN ISO 8493, *Metallic materials — Tube — Drift-expanding test (ISO 8493)*

EN ISO 8495, *Metallic materials — Tube — Ring-expanding test (ISO 8495)*

EN ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1)*

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

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

EN ISO 15614-1, *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)*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020, EN 10021, EN ISO 4885, EN 10079 and EN ISO 377 and the following apply.

ISO and IEC maintain terminology 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 Terms and definitions

3.1.1
model
designation for elbows, return bends, reducers, caps and tees

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

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

Note 3 to entry: For caps the model specifies the shape of the piece.

Note 4 to entry: For tees the model specifies tee, pulled tee, branch welded tee (v-welded) and branch welded tee (circumferential welded) shape of the piece.

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3.1.2
welded fitting
fittings made from welded tubes or fittings made from plate/sheet or strip where welding is a part of the manufacturing process

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3.1.3
seamless fitting
fittings manufactured without welding from starting material which is not welded

3.1.4
purchaser
person or organisation that orders products in accordance with this document

3.1.5
employer
organisation for which a person works on a regular basis

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

3.2 Symbols and abbreviations

For the purpose of this document, the symbols given in EN 10266 and the following apply.

A	Percentage of elongation at rupture, with reference to gauge length of $5,65 \times \sqrt{S_0}$
B	Back to face distance for return bends, expressed in millimetres
C	Centre to centre distance for return bends ($C = 2R$), expressed in millimetres

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d_{a1}	Maximum outside diameter of the fitting at the base of corrugation #1, expressed in millimetres
d_{a2}	Maximum outside diameter of the fitting at the top of corrugation #1, expressed in millimetres
d_{a3}	Maximum outside diameter of the fitting at the base of corrugation #2, expressed in millimetres
d_{a4}	Maximum outside diameter of the fitting at the top of corrugation #2, expressed in millimetres
D	Specified outside diameter for elbows, return ends, equal tees, caps and the major outside diameter for reducers and reducing tees, expressed in millimetres
D_1	Specified minor outside diameter for reducers and reducing tees, expressed in millimetres
D_{max}	Maximum diameter in one section, expressed in millimetres
D_{min}	Minimum diameter in the same section, expressed in millimetres
DN, DN_1	Conventional dimension used in piping; non-measurable value (see EN ISO 6708)
F	Distance from the axis of the branch outlet to the face of the centre body of tees, expressed in millimetres
G	Distance from the axis of the centre line to the face of the branch outlet of reducing tees, expressed in millimetres
h_m	Mean height of corrugation, expressed in millimetres
HBW	Brinell hardness
ID	Internal diameter at the welding ends of elbows, return bends, equal tees and at the major welding end of reducers and reducing tees ($ID = D - 2T$), expressed in millimetres
ID_1	Internal diameter at the minor welding end of reducers and reducing tees ($ID_1 = D_1 - 2T_1$), expressed in millimetres
K	Total height for caps, expressed in millimetres
L	Face to face distance for reducers, expressed in millimetres
LE	Length of corrugation, expressed in millimetres
O_v	Out of roundness, expressed in %
R_2	Inside knuckle radius of cap
R	Bending radius of elbows and return bends, expressed in millimetres
R_m	Tensile strength at room temperature, expressed in MPa
$R_{p0,2}$	0,2 % proof strength, plastic extension at room temperature, expressed in MPa
$R_{p1,0}$	1,0 % proof strength, plastic extension at room temperature, expressed in MPa
T	Specified wall thickness at the welding ends for elbows, return bends and equal tees or on the D end for reducers and reducing tees, expressed in millimetres
T_1	Specified wall thickness on the D_1 welding end of reducers and reducing tees, expressed in millimetres

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W0	Welded from hot or cold rolled plate, sheet or strip 1D, 2D, 2E, 2B (symbols of flat products according to EN 10088-2)
W1	Welded from hot rolled plate, sheet or strip 1D, descaled
W2	Welded from cold rolled plate, sheet or strip 2D, 2E, 2B, descaled
X	Tolerance on the form of fittings
Z	Distance from the extrados to the centre of a 45° elbow at the welding ends, expressed in millimetres

4 Classification of grades and designation

4.1 Classification of grades

Steels covered in this document are classified according to their structure into:

— austenitic steels;

— austenitic–ferritic (duplex) steels.

For more details see EN 10088-1.

4.2 Designation

For the fittings covered by this document the designation shall consist of:

— number of this document (EN 10253-3); plus either

  — steel name in accordance with EN 10027-1; or

  — steel number allocated in accordance with EN 10027-2.

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5 Information to be supplied

5.1 Mandatory information

5.1.1 General

The following information shall be supplied for purchasing at the time of enquiry and order.

5.1.2 Designation of fittings

5.1.2.1 Elbows and return bends

Elbows and return bends are designated by the model (2D, 3D, 5D, D+100 etc.), the angle and the outside diameter D.

5.1.2.2 Reducers

Reducers are designated by the model (concentric, concentric straight, eccentric, or eccentric straight), the major diameter D and the minor diameter D_1.

5.1.2.3 Tees

Equal tees are designated by the outside diameter D.

Reducing tees are designated by the major diameter D and by the minor diameter D_1.

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Model: tee, pulled tee, branch welded tee (v-welded) or branch welded tee (circumferential welded).

5.1.2.4 Caps

Caps are designated by the outside diameter *D*.

5.1.3 Information

The following information shall be supplied at the time of enquiry and order:

a) quantity required (number of pieces);

b) designation of fittings (see 5.1.2) and the wall thickness T (T_1);

c) designation of the steel grade according to this document;

d) reference to this document and its year of publication;

e) options, if any (see 5.2).

5.2 Options

A number of options are specified in this document, which are listed below. In the event that no options have been specified at the time of enquiry and order, the fittings shall be supplied in accordance with the basic specification (see 5.1).

1) steelmaking process (see 6.1);

2) heat treatment of the fittings (see 6.2.3.1, Table 4, and Table 5);

3) tensile test on base material at room temperature (see 7.4, 10.2.1, Table 4, Table 5, and Table 11);

4) agreed mechanical properties for wall thicknesses greater than 60 mm apply (see 7.4 and Table 4);

5) intergranular corrosion test (see 7.5, 10.5, and Table 11);

6) surface treatment (see 7.6.2.10);

7) non-destructive testing of the weld area (see 7.6.3 and 10.8.2, and Table 11);

8) structural dimensions of fittings not covered by Annex A (see 7.7.1.2);

9) fittings are ordered with tolerance class D3 or D4 (see 7.7.2.1 and Table 7);

10) end bevelling shall be agreed at the time of enquiry and order (see 7.7.4);

11) the test unit size shall be as specified on the purchase order (see 9.1 and Table 10);

12) weld bend test (welded fittings) (see 10.4 and Table 11);

13) tensile test on the weld at room temperature (see 10.3 and Table 11);

14) liquid penetrant examination of welds and weld ends (see 10.8.2 and Table 11);

15) liquid penetrant examination of surfaces, extent shall be specified at the time if the enquiry (see 10.8.2 and Table 11);

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16) additional marking (see Clause 11);

17) special packaging, coating or end plugs as agreed at the time of enquiry or order shall be applied (see Clause 12);

18) tensile test at elevated temperature (see Table 11).

5.3 Examples of an order

5.3.1 Example 1

1 000 elbows in accordance with this document of type 3D with angle 90°, dimensions 60,3 × 2,9, made of steel grade 1.4436 and with a joint coefficient 0,7.

1 000 elbows – EN 10253-3 – type 3D – 90° – 60,3 × 2,9 × 1.4436

5.3.2 Example 2

1 000 elbows in accordance with this document of type 3D with angle 90°, dimensions 60,3 × 2,9, made of steel grade 1.4436 and with non-destructive testing of the weld area (joint coefficient 0,85).

1 000 elbows – EN 10253-3 – type 3D – 90° – 60,3 × 2,9 – 1.4436 – Option 7

5.3.3 Example 3

2 000 concentric reducers in accordance with this document with dimensions 219,1 × 6,3 – 139,7 × 4,0, made of steel grade X2CrNi19-11 and with a joint coefficient 0,7.

2 000 concentric reducers – EN 10253-3 – 219,1 × 6,3 – 139,7 × 4,0 – X2CrNi19-11

5.3.4 Example 4

3 000 equal tees in accordance with this document with dimension *ID* 40,0 × 2,0 made of steel grade 1.4301, with a joint coefficient 0,85, with a non-destructive testing of the weld area.

3 000 equal tees – EN 10253-3 – ID 40,0 × 2,0 – 1.4301 – Option 7

6 Manufacturing process

6.1 Steelmaking process

The steelmaking process is left to the discretion of the steel manufacturer.

For manufacturing, a quality management system and an environmental management system shall be used.

NOTE 1 Quality management systems according to or equivalent to EN ISO 9001 and environmental management systems according to or equivalent to EN ISO 14001 are considered acceptable.

Option 1: *The purchaser shall be informed about the steelmaking process used. The process shall be reported in the inspection document.*

NOTE 2 The purchaser can receive information on environmental aspects of the steelmaking process; for example, the operation of the manufacturer under an environmental management system.

6.2 Product making process for fittings and heat treatment

6.2.1 Product making process

The method of manufacturing is left to the discretion of the manufacturer.

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