



SLOVENSKI STANDARD

oSIST prEN 10374:2020

01-februar-2020

Varjeni spojni elementi za živilsko in kemično industrijo - Odcepi, kolena in reducirni elementi za varjenje

Welded fittings for the food and chemical industries - Tees, bends and reducers for welding

Anschweißarmaturen in der Lebensmittel- und chemischen Industrie - T-Stücke, Bogen und Reduzierstücke zum Anschweißen

Raccords soudés pour l'industrie alimentaire et chimique - Tés, coudes et réducteurs à souder

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Ta slovenski standard je istoveten z: prEN 10374

ICS:

23.040.40 Kovinski fitingi Metal fittings

oSIST prEN 10374:2020 en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 10374

December 2019

ICS 23.040.40

English Version

Welded fittings for the food and chemical industries - Tees, bends and reducers for welding

Raccords soudés pour l'industrie alimentaire et chimique - Tés, coudes et réducteurs à souder

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 10.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 10374:2019) has been prepared by Technical Committee CEN/TC 459/SC 10 “Steel tubes and fittings for steel tubes”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

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prEN 10374:2019 (E)**1 Scope**

This document specifies dimensions, tolerances, internal and external surface characteristics and marking of welded fittings for the food and chemical industry.

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

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

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

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

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

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

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

EN 10253-4, *Butt-welding pipe fittings — Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements*

EN 13480 (all parts), *Metallic industrial piping*

EN 10357, *Austenitic, austenitic-ferritic and ferritic longitudinally welded stainless steel tubes for the food and chemical industry*

EN ISO 4287, *Geometrical product specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287)*

EN ISO 4288, *Geometrical product specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture (ISO 4288)*

EN ISO 6520-1, *Welding and allied processes — Classification of geometric imperfections in metallic materials — Part 1 Fusion welding (ISO 6520-1)*

ISO 13715, *Technical product documentation — Edges of undefined shape — Indication and dimensioning*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 6520-1 and the following apply.

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

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

3.1

elbow

bend fitting to allow a change direction of the pipeline with a radius 45°, 90° or 180°

3.1.1

elbow form BS (short execution)

elbows with standard welding ends

3.1.2

elbow form BL (long execution)

elbows with prolonged welding ends

3.2

reducer

fitting that reduces the pipeline size from larger to a smaller diameter

3.2.1

reducer form RCS (short type)

reducer with concentric diameters with short length

3.2.2

reducer form RCL (long type)

reducer with concentric diameters with long length

3.2.3

reducer form RES (short type) (standards.iteh.ai)

reducer with eccentric diameters with short length

3.2.4

reducer form REL (long type) <https://standards.iteh.ai/catalog/standards/sist/afd8f384-90d3-437d-94b5-cb350236b2ad/osist-pren-10374-2020>

reducer with eccentric diameters with long length

3.3

T-piece

T-shaped fitting with a straight run and a branch perpendicular to the run

3.3.1

T-piece form TL

T-piece with equal tube diameter connections

3.3.2

T-piece form TS

T-piece with a short branch and equal tube diameter connections

3.3.3

T-piece form TRL

T-piece with the branch tube diameter connection smaller than the run tube diameter connections

3.3.4

T-piece form TRS

T-piece with branch short length and the branch tube diameter connection smaller than the run tube diameter connections

4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviated terms in Table 1 shall be applied.

Table 1 — Symbols and abbreviated terms

Symbol	Unit	Description
$d_1 d_2$	mm	specified inside diameter for reducers
D, OD	mm	specified outside diameter for T-pieces and elbows
l_0	mm	<ul style="list-style-type: none"> – distance from the axis of the branch outlet to the face of the centre body of the T-pieces – distance from the centre of one welding end to the centre of a 90° elbow form BS at the welding ends – distance from one welding end to the axis of the centre line for elbow form BS-180
l_{0BS5}	mm	distance from the centre of one welding end to the centre of a 90° elbow form BS5 at the welding ends
l_1	mm	<ul style="list-style-type: none"> – distance from the centre of one welding end to the centre of a 90° elbow form BL at the welding ends – distance from one welding end to the axis of the centre line for elbow form BL-180 – face to face distance of reducer form RK
l_2	mm	<ul style="list-style-type: none"> – distance from the axis of centre line of the run to the face of the branch outlet of tees – distance from one welding end to centre for elbow form BL-45 – face to face distance of reducer form RE
l_3	mm	– difference between elbow form BL5-90 and BS5-90, BL-45 and BS-45, BL-90 and BS-90, BL-180 and BS-180 at the welding ends aka tangent length
l_4	mm	centre to centre distance for elbows 180°
l_{1BL5}	mm	distance from the centre of one welding end to the centre of a 90° elbow form BL5 at the welding ends
l_5	mm	distance from the extrados of a BS-45 or a BL-45 bend to the face of the welding end
O	%	out-of-roundness
R, R_{BS5}, R_{BL5}	mm	bending radius of elbows
s, s_1, s_2	mm	specified wall thickness at the welding ends for T-pieces, elbows and reducers
WT	mm	wall thickness of T-piece

5 Designation of fittings and steel grades

5.1 Designation of fittings

Fittings are designated by their name and the following parameters.

5.2 Elbow

The elbows are designated by the following parameters:

- a) form (BS, BL, BS5, BL5);
- b) angle (45°, 90°, 180°);
- c) tube dimensions (outside diameter and wall thickness).

5.3 Reducer

The reducer are designated by the following parameters:

- a) form (RCS or RCL or RES or REL);
- b) tube dimensions with major diameter (outside diameter and wall thickness);
- c) tube dimensions with minor diameter (outside diameter and wall thickness).

5.4 T-piece

5.4.1 T-piece form TL and form TS

The T-piece equal execution are designated by the following parameters:

- a) form (TL or TS);
- b) tube dimensions (outside diameter and wall thickness).

5.4.2 T-piece form TRL and form TRS

The T-piece reduced execution are designated by the following parameters:

- a) form (TRL or TRS);
- b) tube dimensions with major diameter (outside diameter and wall thickness);
- c) tube dimensions with minor diameter (outside diameter and wall thickness).

5.5 Designation of steel grades

For fittings covered by this document the steel designation consists of the steel name in accordance with EN 10027-1 or the steel number allocated in accordance with EN 10027-2.

prEN 10374:2019 (E)**6 Information to be supplied by the purchaser****6.1 Mandatory information**

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

- a) quantity required (number of pieces);
- b) reference to this document;
- c) designation of fittings (see 5.1);
- d) steel name or number according to EN 10088-1;
- e) heat treatment (see 7.2.3).

6.2 Options

A number of options are specified in this standard and listed below. If the purchaser does not indicate a wish to implement any of these options at the time of enquiry and order, the products shall be supplied in accordance with the basic specification (see 6.1).

- a) Welds shall be finished by grinding and/or mechanical polishing (see paragraph 7.2.2);
- b) Inspection document according to EN 10204 (see paragraph 9.2).

6.3 Examples of an order**Example 1**

500 elbows in accordance with this document, form BS-90 for tube having an outside diameter of 41 mm and a wall thickness of 1,5 mm, made of steel grade 1.4301, with heat treatment "a"

500 elbows — EN 10374 — BS-90 41x1.5 — 1.4301 — a.

Example 2

100 Reducers in accordance with this document, form REL for tubes having an outside diameter 85 and 70 mm- and a wall thickness of 2 mm, made of steel grade 1.4301, with heat treatment "a"

100 reducers — EN 10374 — REL 85x2/70x2 — 1.4301 — a.

Example 3

300 T-pieces in accordance with document, form TS for tube having an outside diameter of 29 mm and a wall thickness of 1,5 mm, made of steel grade 1.4301, with heat treatment "u"

300 T-pieces — EN 10374 — TL 29x1.5 — 1.4301 — u — option 7.2.2 (f) — option 9.2 (a).

7 Requirements

7.1 Material

Fittings manufactured according with this document shall be in stainless steel.

The chemical composition of the stainless steel fittings shall be in accordance with the EN 10088-1.

For guidance, the most commonly used materials are listed in Annex B (Table B.1).

7.2 Manufacturing Process

7.2.1 General

The method of manufacturing and the relevant starting product forms are left at the discretion of the manufacturer. When manufacturing fittings from welded tubes, tubes shall be supplied and delivered in accordance with EN 10357 or EN 10217-7. When manufacturing fittings from seamless tubes, tubes shall be supplied and delivered in accordance with EN 10216-5. Sheet and strip used in manufacturing shall be supplied and delivered in accordance with EN 10088-2 or EN 10028-7.

7.2.2 Welding

Welding processes used in the manufacturing of fittings may be Gas Tungsten Arc Welding (GTAW), Laser Beam Welding, or Electron Beam Welding. Welds shall be left in the as-welded condition (designator w) or finished after welding (designator f) (paragraph 6.2, option a). If not specified at the time of enquiry and order the condition of the welds is at the discretion of the manufacturer. Welds used in the as-welded condition shall meet the acceptance criteria as per Table 2. Welds finished after welding shall be flush with the base metal and shall meet the acceptance criteria as per Table 2. Welds finished after welding shall meet the R_a requirements of paragraph 7.2.4.

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Table 2 — Visual examination acceptance criteria for groove welds on butt joints ^a

Classification of imperfections as per EN ISO 6520-1		Requirements for fittings
Ref. No.	Designation	
100	Crack	None accepted
104	Crater crack	None accepted
2017	Surface pore	None accepted
2025	End crater pipe (crater shrinkage, shrinkage hole)	None accepted
301	Oxide island (slag inclusion)	Oxide islands are permitted as long as they are adherent to the surface
401	Lack of fusion	None accepted
4021	Incomplete root penetration	None accepted
5011	Continuous undercut	None accepted ^b
5012	Intermittent undercut	None accepted ^b
5013	Shrinkage grooves (undercuts visible on each side of the root run)	None accepted ^b
502	Excessive weld metal (convexity, butt weld)	$\leq 0,15 t$ ^{b c}
504	Excessive penetration (convexity, butt weld)	$\leq 0,15 t$ ^{b c}
5072	Linear misalignment between tubes	$\leq 0,15 t$ ^{b c}
509	Sagging (weld metal collapse due to gravity)	$\leq 0,15 t$ ^{b c}
511	Incompletely filled groove (concavity, butt weld)	$\leq 0,15 t$ ^{b c}
515	Root concavity (concavity, butt weld)	$\leq 0,15 t$ ^{b c}
516	Root porosity	None accepted
601	Arc strike (stray arc)	None accepted
602	Spatter	None accepted
610	Temper colours (visible oxide film)	None accepted

^a Examination of welds is limited to visual examination of surface imperfections and measurement of geometric imperfections. Examination of inner imperfections is outside the scope of this document.

^b Acceptance criteria only applies to the i/d surface

^c t = nominal wall thickness, in case of different nominal wall thicknesses the thinner wall applies