



**SLOVENSKI STANDARD**  
**oSIST prEN 10378:2024**  
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**Varjene kvadratne in pravokotne cevi iz nerjavnega jekla za mehansko, inženirsko in dekorativno uporabo - Tehnični dobavni pogoji**

Welded stainless steel square and rectangular tubes for mechanical, engineering and decorative use - Technical delivery conditions

Geschweißte quadratische und rechteckige Rohre aus nichtrostendem Stahl für den Maschinenbau und dekorative Anwendungen - Technische Lieferbedingungen

Tubes carrés et rectangulaires soudés en acier inoxydable pour usage mécanique, technique et décoratif - Conditions techniques de livraison

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## Welded stainless steel square and rectangular tubes for mechanical, engineering and decorative use - Technical delivery conditions

Geschweißte quadratische und rechteckige Rohre aus  
nichtrostendem Stahl für den Maschinenbau und  
dekorative Anwendungen - Technische  
Lieferbedingungen

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.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## **prEN 10378:2024 (E)**

### **European foreword**

This document (prEN 10378:2024) has been prepared by Technical Committee CEN/TC 459/SC10 “Steel tubes, and iron and steel fittings”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

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## 1 Scope

This document specifies the technical delivery conditions for welded tubes, of square and rectangular cross section, made from stainless steels, for mechanical and general engineering purposes.

This document does not apply to welded stainless steel hollow sections intended to be used in metal structures, composite metal structures and concrete structures in the construction sector covered by Regulation (EU) 305/2011.

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

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

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

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

CEN/TR 10261, *Iron and steel - European standards for the determination of chemical composition*

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

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

EN ISO 14284, *Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284)*

**prEN 10378:2024 (E)****3 Terms and definitions**

For the purpose of this document, the terms and definitions given in EN 10020, EN 10021, and EN 10266 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/>

**4 Symbols**

For the purposes of this document, the symbols given in Table 1 apply.

**Table 1 — List of symbols**

<b>Symbol</b>	<b>Description</b>	<b>Unit</b>
$A$	Cross-sectional area	$\text{mm}^2$
$A_s$	Superficial area per metre length	$\text{m}^2/\text{m}$
$A_5$	Percentage elongation after fracture	%
$B$	Specified side dimension of a square tube. Specified dimension of the shorter side of a rectangular tube.	$\text{mm}$
$C_1/C_2$	Length of corner region of a square or rectangular tube	$\text{mm}$
$C_t$	Torsional modulus constant	$\text{cm}^3$
$e$	Deviation from straightness	$\text{mm}$
$H$	Specified dimension of the longer side of a rectangular tube.	$\text{mm}$
HFIW	High Frequency Induction Welding	–
$I$	Second moment of area	$\text{cm}^4$
$I_t$	Torsional inertia constant	$\text{cm}^4$
$L_o$	Original gauge length	$\text{mm}$
$i$	Radius of gyration	$\text{cm}$
$L$	Length	$\text{mm}$
$M$	Mass per unit length	$\text{Kg}/\text{m}$
NDT	Non destructive testing	–
$R$	External corner radius of a square or rectangular tube	$\text{mm}$
$r_o$	External corner radius	$\text{mm}$
$R_{p0.2}$	0,2 % proof strength (yield strength)	$\text{MPa}$
$R_m$	Tensile strength	$\text{MPa}$
$\rho$	Density of stainless steel	$\text{kg}/\text{dm}^3$
$S_o$	Original cross-sectional area of the parallel length	$\text{mm}^2$
$T$	Specified wall thickness	$\text{mm}$



Symbol	Description	Unit
$\theta$	Angle between adjacent sides of a square or rectangular tube	°
$V$	Total measured twist	mm
$V_l$	Twist measured at one end of a section	mm
Wel	Elastic section modulus	cm <sup>3</sup>
Wpl	Plastic section modulus	cm <sup>3</sup>
$x_1$	Concavity of a side of a square or rectangular tube	mm
$x_2$	Convexity of a side of a square or rectangular tube	mm
yy	Axis of cross-section, major axis of a rectangular tube	-
zz	Axis of cross-section, minor axis of a rectangular tube	-

## 5 Classification and designation

### 5.1 Grades and qualities

The stainless steels of this document are subdivided in grades on the basis of the chemical composition.

### 5.2 Designation

For the stainless steel grades covered by this document the steel names shall be allocated in accordance with EN 10027-1; the steel numbers shall be allocated in accordance with EN 10027-2.

## 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) the quantity (mass or total length or number);
- b) the term “square tube” or “rectangular tube”;
- c) the dimensions (outside dimensions B, H and wall thickness T) (see 8.5);
- d) the steel designation (see 5.2).

### 6.2 Options

A number of options are specified in this document and these are listed below with appropriate clause references. In the event that the purchaser does not indicate a wish to implement any of these options at the time of enquiry and order, the tube shall be supplied in accordance with the basic specification (see 6.1).

- 1) delivery condition and/or process route (see 7.3);
- 2) product analysis for the tube (see 8.2.2);
- 3) random length (see 8.5.2);
- 4) exact length (see 8.5.2);

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- 5) type of length, Range of length or Length (see 8.6.2 Tab. 12);
- 6) dimple category (see 8.6.4 Tab. 14);;
- 7) specific inspection and testing (see 9.1 and 9.2.1)
- 8) inspection certificate “type 3.2” (see 9.2.1);
- 9) test piece for tensile test shall contain the weld (see 10.2.2);
- 10) tensile test at elevated temperature (see 11.7);
- 11) additional marking (see 12.2);
- 12) special protection (see Clause 13).

**6.3 Example of an order**

Fifteen tonnes of welded stainless steel square tubes with a specified outside dimensions 20x20 mm, a specified wall thickness of 1,2 mm, in accordance with EN xxx, made from steel grade 1.4301.

15 t – Tube – 20x20 × 1.2 - EN 10378 - 1.4301

**7 Manufacturing process****7.1 Steel making process**

Unless a special steelmaking process is agreed at the time of enquiry and order, the steelmaking process for stainless steels used for the manufacture of the square and rectangular tubes conforming to this document shall be at the discretion of the tube manufacturer.

**7.2 Tube manufacturing process**

Tubes shall be manufactured by a continuous automatic welding process with or without addition of filler material, starting from hot or cold rolled coils of stainless steel. Tubes manufactured by a continuous process shall not include the welds used to join the lengths of strip prior to forming the tube. However, jointers are permitted when the purchaser specifies lengths in excess of the production maximum, if agreed at the time of enquiry and order.

The admitted welding processes are: automatic arc welding, laser welding, high frequency induction welding (HFIW). If required the process route shall be declared by the tube manufacturer. If one specific process route would be requested it shall be indicated at the time of enquiry and order (see Option 1).

**7.3 Delivery conditions**

The tubes will be supplied in the delivery conditions specified in Table 2. Depending on the welding process the tubes will be supplied with starting material and weld conditions specified in Table 3.

Unless specified at the time of enquiry and order (see Option 1), the selection of the delivery conditions and process route are at the discretion of the manufacturer.

The cleanness criterion shall be agreed between the customer and the supplier at the time of the enquiry and order.

Table 2 — Delivery conditions

Symbol	Delivery conditions	External surface characteristics
W0	Welded tube from hot rolled or cold rolled strip 1D, 2D, 2E, 2B, 2R	As welded <sup>a</sup>
WG	Welded tube from hot rolled or cold rolled strip 1D, 2D, 2E, 2B: brushed	Unless agreed at the time of enquiry and order the type of brushing shall be at discretion of the manufacturer <sup>b</sup>
WP	Welded tube from hot rolled or cold rolled strip 1D, 2D, 2E, 2B: polished	Unless agreed at the time of enquiry and order the type and degree of polishing shall be at discretion of the manufacturer.
WL	Welded tube from hot rolled or cold rolled strip 1D, 2D, 2E, 2B, 2R: mirror polished	Unless agreed at the time of enquiry and order the type and degree of mirror polishing shall be at discretion of the manufacturer.
WT	Welded tube from hot rolled or cold rolled strip 1D, 2D, 2E, 2B, 2R: surface treatment	As welded + after treatment according customer order; surface treatment shall be defined at the time of enquiry and order
<sup>a</sup> Tubes may have residual scale, welding colours and grease or oil <sup>b</sup> Tubes may have grease or oil residual		

Table 3 — Tube process route, welding process, starting material, weld conditions

Route	Welding process	Starting material	Weld condition
01	Automatic arc welding	Hot or cold rolled strips	as welded;
02			external bead brushed internal bead not rolled
03			external bead brushed internal bead rolled
04	HFIW (high frequency induction welding)	Hot or cold rolled strips	as welded;
05			external bead removed internal bead not removed
06			external bead removed internal bead removed
07	Laser welding	Hot or cold rolled strips	as welded;
08			external bead brushed internal bead not rolled
09			external bead brushed internal bead rolled