SLOVENSKI STANDARD
SIST EN 10217-4:2019

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Nadomešča:
SIST EN 10217-4:2003
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Varjene jeklene cevi za tlačne posode - Tehnični dobavni pogoji - 4. del: Električno varjene nelegirane jeklene cevi s specificiranimi lastnostmi za delo pri nizkih temperaturah

Welded steel tubes for pressure purposes - Technical delivery conditions - Part 4: Electric welded non-alloy steel tubes with specified low temperature properties

Geschweißte Stahlrohre für Druckbeanspruchungen - Technische Lieferbedingungen - Teil 4: Elektrisch geschweißte Rohre aus unlegierten Stählen mit festgelegten Eigenschaften bei tiefen Temperaturen

Tubes soudés en acier pour service sous pression - Conditions techniques de livraison - Partie 4: Tubes soudés électriquement en acier non allié avec caractéristiques spécifiées à basse température

Ta slovenski standard je istoveten z: **EN 10217-4:2019**

ICS:

23.020.32	Tlačne posode	Pressure vessels
77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

SIST EN 10217-4:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10217-4

April 2019

ICS 23.040.10; 77.140.75

Supersedes EN 10217-4:2002

English Version

Welded steel tubes for pressure purposes - Technical delivery conditions - Part 4: Electric welded non-alloy steel tubes with specified low temperature properties

Tubes soudés en acier pour service sous pression - Conditions techniques de livraison - Partie 4: Tubes soudés électriquement en acier non allié avec caractéristiques spécifiées à basse température

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This European Standard was approved by CEN on 25 February 2019.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 10217-4:2019) 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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 10217-4:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2014/68/EU.

For relationship with EU Directive 2014/68/EU (formerly 97/23/EC), see informative Annex ZA, which is an integral part of this document.

This European Standard consists of the following parts, under the general title *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

Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties

Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties

Part 4: Electric welded non-alloy steel tubes with specified low temperature properties

Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties

Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties

Part 7: Stainless steel tubes

Another European Standard series covering tubes for pressure purposes is:

EN 10216, *Seamless steel tubes for pressure purposes.*

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta,

[1] Through its subcommittee SC 10 "Steel tubes, and iron and steel fittings" (secretariat: UNI)

Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the technical delivery conditions for two test categories of electric welded tubes of circular cross section, with specified low temperature properties, made from non-alloy quality steel.

NOTE 1 These tube grades are intended to support the essential requirements of EU Directive 2014/68/EU in respect of pressure equipment with specified low temperature properties covered under all relevant Categories as set out in Article 13 of that Directive.

NOTE 2 Once this standard is published in the Official Journal of the European Union (OJEU), presumption of conformity to the Essential Safety Requirements (ESR) of Directive 2014/68/EU is limited to the technical data for the materials in this standard and does not presume adequacy of the material for a specific item of pressure equipment. Consequently, the assessment of the technical data stated in this material standard against the design requirements of this specific item of equipment to verify that the ESRs of the Pressure Equipment Directive are satisfied, needs to be done by the designer or manufacturer of the pressure equipment, taking also into account the subsequent manufacturing processes which may affect properties of the base materials.

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 10021:2006, *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 10168:2004, *Steel products — Inspection documents — List of information and description*

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

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

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

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

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)*

EN ISO 2566-1:1999, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:1984)*

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

EN ISO 6892-1:2016, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2016)*

EN ISO 8492:2013, *Metallic materials — Tube — Flattening test (ISO 8492:2013)*

EN ISO 8493:2004, *Metallic materials — Tube — Drift-expanding test (ISO 8493:1998)*

EN ISO 8495:2013, *Metallic materials — Tube — Ring-expanding test (ISO 8495:2013)*

EN ISO 8496:2013, *Metallic materials — Tube — Ring tensile test (ISO 8496:2013)*

EN ISO 10893-1:2011, *Non-destructive testing of steel tubes — Part 1: Automated electromagnetic testing of seamless and welded (except submerged arc-welded) steel tubes for the verification of hydraulic leaktightness (ISO 10893-1:2011)*

EN ISO 10893-2:2011, *Non-destructive testing of steel tubes — Part 2: Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections (ISO 10893-2:2011)*

EN ISO 10893-3:2011, *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 10893-8:2011, *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, *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, *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)*

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

ISO 11484:2009, *Steel products — Employer's qualification system for non-destructive testing (NDT) personnel*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020, EN 10021, EN 10266, EN ISO 4885 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
test category
classification that indicates the extent and level of inspection and testing

3.2
employer
organisation for which a person works on a regular basis

Note 1 to entry: The employer may be either the tube manufacturer or a third party organization providing services, such as Non-Destructive Testing (NDT).

3.3
EW
electric welded tube
tubular product having one longitudinal seam weld produced by electric (resistance) welding where the strip edges to be welded are mechanically pressed together and the heat for the welding process is generated by the resistance to flow of low or high frequency electric current applied by either a conduction or induction process

3.4
HFW
high frequency welded tube
EW tube produced specifically using a welding current frequency equal to or greater than 100 kHz

4 Symbols

For the purposes of this document, the symbols given in EN 10266 apply.

5 Classification and designation

5.1 Classification

In accordance with the classification system in EN 10020, the steel grades given in Tables 2 and 4 are classified as non-alloy quality steels.

5.2 Designation

5.2.1 For the tubes covered by this document, the steel designation consists of:

— the number of this document;

plus either:

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

or:

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

5.2.2 The steel name is designated by:

— the capital letter P for pressure purposes;

— the indication of the specified minimum yield strength at room temperature for thickness less than or equal to 16 mm, expressed in MPa (see Table 4);

— the symbol N to designate normalized delivery condition (see Table 1);

— the symbol L for low temperature.

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, total length or number of tubes of set length);

b) the term 'tube' and tube type, HFW;

c) the dimensions (outside diameter D, wall thickness T) (see Table 6);

d) the random length range (see 8.7.3);

e) for tubes with a $D/T > 100$, out of roundness limits (see 8.7.4.4).

f) the designation of the steel grade in accordance with this document (see 5.2);

g) the test category (see 9.3).

6.2 Options

A number of options are specified in this document and these are listed below. 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 tubes shall be supplied in accordance with the basic specification (see 6.1).

1) Tube manufacturing route (see 7.2.2);

2) Restriction on copper and tin content (see Table 2);

3) Product analysis (see 8.2.2);

4) Selection of method for verification of leak-tightness (see 8.4.3.1);

5) Non-Destructive Testing of test category 2 tubes for the detection of transverse imperfections (see 8.4.3.2);

6) Non-Destructive Testing of test category 2 tubes for the detection of laminar imperfections (see 8.4.3.2);

7) Special end preparation (see 8.6);

8) Exact lengths (see 8.7.3);

9) Inspection document 3.2 in place of the standard 3.1 Inspection Certificate (see 9.2.1);

10) Verification of tensile strength of the weld in the transverse direction for tubes of outside diameter $D > 219{,}1$ mm (see Table 10);

11) Agreement of a different test pressure for hydrostatic leak-tightness test (see 11.9.1);

12) Wall thickness measurement away from the ends (see 11.10);

13) Selection of the Non-Destructive Testing method for the inspection of the weld seam of test category 1 tubes (see 11.12.1);

14) Selection of the Non-Destructive Testing method for the full peripheral inspection of test category 2 tubes (see 11.12.2);

15) Additional marking (see 12.2);

16) Protection (see Clause 13).

6.3 Example of an order

500 m of HFW tube with an outside diameter of 168,3 mm, a wall thickness of 4,5 mm in accordance with EN 10217-4, made of steel grade P265NL, test category 1, in 6 m random lengths, with a 3.2 inspection certificate in accordance with EN 10204:

500 m – HFW Tube - 168,3 × 4,5 - EN 10217–4 — P265NL - TC 1 - 6m - Option 9: 3.2

7 Manufacturing process

7.1 Steelmaking process

The steelmaking process is at the discretion of the manufacturer with the exception that the open hearth (Siemens-Martin) process shall not be employed unless in combination with a secondary steelmaking or ladle refining process.

Steels shall be fully killed and contain nitrogen binding elements, details of which shall be reported.

NOTE This excludes the use of rimming, balanced or semi-killed steel.

7.2 Tube manufacture and delivery conditions

7.2.1 The tubes shall be manufactured by an electric welding process employing high frequency welding (HFW), of minimum frequency 100 kHz in accordance with one of the manufacturing routes specified in Table 1.

Unless Option 1 is specified the manufacturing route is at the discretion of the manufacturer.

Option 1: *The manufacturing route from Table 1 is specified by the purchaser.*

The finished tubes shall not include the welds used to join together the lengths of the strip prior to forming.

7.2.2 Tube production welding shall be carried out by suitably qualified personnel in accordance with documented procedures. For tubes intended for use in pressure equipment under European legislation, manufacturers shall employ an established procedure for the approval of welding operatives.

The production (welding) process for HFW tubes shall be qualified and approved under the tube manufacturer's own QA system.

7.2.3 The delivery conditions of tubes covered by this document are shown in Table 1.