SLOVENSKI STANDARD
SIST EN 10216-1:2003

01-april-2003

Nevarjene jeklene cevi za tlačne posode - Tehnični dobavni pogoji - 1. del: Nelegirane jeklene cevi s specificiranimi lastnostmi za delo pri sobni temperaturi

Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non -alloy steel tubes with specified room temperature properties

Nahtlose Stahlrohre für Druckbeanspruchungen - Technische Lieferbedingungen - Teil 1: Rohre aus unlegierten Stählen mit festgelegten Eigenschaften bei Raumtemperatur

Tubes sans soudure en acier pour service sous pression - Conditions techniques de livraison - Partie 1: Tubes en acier non allié avec caractéristiques spécifiées a température ambiante

Ta slovenski standard je istoveten z: **EN 10216-1:2002**

ICS:

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

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EUROPEAN STANDARD

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Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steel tubes with specified room temperature properties

Tubes sans soudure en acier pour service sous pression - Conditions techniques de livraison - Partie 1: Tubes en acier non allié avec caractéristiques spécifiées à température ambiante

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This European Standard was approved by CEN on 25 April 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 10216-1:2002) has been prepared by Technical Committee ECISS/TC 29, "Steel tubes and fittings for steel tubes", the secretariat of which is held by UNI.

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 November 2002, and conflicting national standards shall be withdrawn at the latest by November 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(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

Other Parts of EN 10216 are:

Part 2 : Non-alloy and alloy steels tubes with specified elevated temperature properties

Part 3 : Alloy fine grain steel tubes

Part 4 : Non-alloy and alloy steel tubes with specified low temperature properties

Part 5 : Stainless steel tubes

Another European Standard series covering tubes for pressure purposes is:

EN 10217: Welded steel tubes for pressure purposes

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of EN 10216 specifies the technical delivery conditions for two qualities TR1 and TR2 of seamless tubes of circular cross section with specified room temperature properties made of non-alloy quality steel.

2 Normative references

This European Standard incorporates by date or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For date references, subsequent amendments to or revisions of, any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

The requirements of this European Standard rule when they differ from those in the standards and documents referred to below:

EN 10002-1, *Metallic materials - Tensile testing Part 1 : Method of test (at ambient temperature).*

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

EN 10021, *General technical delivery requirements for steel and iron products.*

EN 10027-1, *Designation systems for steels - Part 1 : Steel names, principle symbols.*

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

EN 10045-1, *Metallic materials - Charpy impact test Part 1 : Test method.*

EN 10052, *Vocabulary of heat treatment terms for ferrous products.*

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

ENV 10220, *Seamless and welded steel tubes - Dimensions and masses per unit length.*

EN 10246-1, *Non-Destructive Testing of steel tubes Part 1 : Automatic electromagnetic testing of seamless and welded (except submerged arc welded) ferromagnetic steel tubes for verification of hydraulic leak-tightness.*

EN 10246-3, *Non-Destructive Testing of steel tubes - Part 3 :Automatic eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections.*

EN 10246-5, *Non-Destructive Testing of steel tubes – Part 5: Automatic full peripheral magnetic transducer/flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal imperfections.*

EN 10246-7, *Non-Destructive Testing of steel tubes - Part 7 : Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc welded) steel tubes for the detection of longitudinal imperfections.*

EN 10256, *Non-DestructiveTesting of steel tubes - Qualification and competence of level 1 and level 2 NDT personnel.*

prEN 10168[1)], *Iron and steel products - Inspection documents - List of information and description*

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1) In preparation, until this document is published as European Standard, the corresponding National standard should be agreed at the time of enquiry and order.

prEN 10266[1)], *Steel tubes, fittings and structural hollow sections - Symbols and definition of terms for use in product standards*

EN ISO 377, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997)*

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

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

CR 10260, *Designation systems for steel - Additional symbols*

CR 10261, *ECISS Information Circular IC 11 - Iron and steel - Review of available methods of chemical analysis.*

3 Terms and definitions

For the purposes of this Part of EN 10216, the terms and definitions given in EN 10020, EN 10021, EN 10052, prEN 10266 and the following apply:

3.1
employer
organization for which a person works on a regular basis.

NOTE The employer may be either the tube manufacturer or a third party organization providing non-destructive testing (NDT) services.

4 Symbols

For the purpose of this Part of EN 10216 the symbols given in prEN 10266 apply.

5 classification and designation

5.1 Classification

According to the classification system in EN 10020, the steels are classified as non-alloy quality steels.

5.2 Designation

5.2.1 For the tubes covered by this Part of EN 10216 the steel designation consists of:

— the number of this Part of EN 10216;

plus either:

— the steel name in accordance with EN 10027-1 and CR 10260;

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 for thickness ≤ 16 mm, expressed in MPa (see Table 4);

— plus either:

— the alphanumeric TR1 for qualities without specified aluminium content, impact properties and specific inspection and testing requirements (see 9.1);

or:

— the alphanumeric TR2 for qualities with specified aluminium content, impact properties and specific inspection and testing requirements.

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 “tube”;

c) the dimensions (outside diameter D and wall thickness T) (see Table 5);

d) the designation of the steel grade in accordance with this Part of EN 10216 (see 5.2).

6.2 Options

A number of options are specified in this Part of EN 10216 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) delivery condition normalized or normalizing-formed (see 7.3.2);

2) restriction on copper and tin contents (see Table 2);

3) product analysis (see 8.2.2);

4) longitudinal impact testing at −10 °C for quality TR2 (see Table 4);

5) selection of leak-tightness test method (see 8.4.2.1);

6) Non-DestructiveTesting for quality TR2 (see 8.4.2.2);

7) special end preparation (see 8.6);

8) exact lengths (see 8.7.3);

9) specific inspection for quality TR1 (see 9.1);

10) type of inspection document other than the standard document (see 9.2.1);

11) test unit restriction for tubes with D ≤ 76,1 mm of quality TR2 (see 10.1.1);

12) wall thickness measurement away from the ends (see 11.5);

13) additional marking (see 12.2);

14) protection (see 13).

6.3 Example of an order

100 t of seamless tube with an outside diameter of 168.3 mm, a wall thickness of 4,5 mm, in accordance with EN 10216-1, made of steel grade P235TR2 with a 3.1.C inspection certificate in accordance with EN 10204.

100 t - Tube – 168,3 × 4,5 - EN 10216-1 - P235TR2 - Option 10: 3.1.C

7 MANUFACTURING PROCESS

7.1 Steelmaking process

The steelmaking process is at the discretion of the manufacturer.

7.2 Deoxidation process

Steels shall be fully killed.

7.3 Tube manufacture and delivery conditions

7.3.1 All NDT activities shall be carried out by qualified and competent level 1,2 and/or 3 personnel authorised to operate by the employer.

The qualification shall be in accordance with EN 10256 or, at least, an equivalent to it.

It is recommended that the level 3 personnel be certified in accordance with EN 473 or, at least, an equivalent to it.

The operating authorisation issued by the employer shall be in accordance with a written procedure.

NDT operations shall be authorised by level 3 NDT individual approved by the employer.

Note : The definition of level 1, 2 and 3 can be found in appropriate Standards, e.g. EN 473 and EN 10256

7.3.2 The tubes shall be manufactured by a seamless process. The forming operations and delivery conditions are shown in Table 1.

Table 1 — Forming operations and delivery conditions

Forming operation	Quality	Delivery condition
Hot formed	TR1	As formed or normalized or normalising-formed [a]
	TR2	Normalized or normalising-formed
Hot formed + cold finished	TR1 and TR2	Normalized
[a] At the discretion of the manufacturer unless option 1 is specified.		

Option 1 : *The tube shall be supplied in normalized or normalising-formed delivery condition.*

8 REQUIREMENTS

8.1 General

When supplied in a delivery condition indicated in 7.3 and inspected in accordance with clauses 9, 10 and 11, the tubes shall conform to the requirements of this Part of EN 10216.

In addition, the general technical delivery requirements specified in EN 10021 shall apply.

8.2 Chemical composition

8.2.1 Cast analysis

The cast analysis reported by the steel producer shall apply and conform to the requirements of Table 2.

NOTE. When welding tubes produced in accordance with this Part of EN 10216, account should be taken of the fact that the behaviour of the steel during and after welding is dependent not only on the steel, but also on the applied heat treatment and the conditions of preparing for and carrying out the welding.

Table 2 — Chemical composition (cast analysis) [a] in % by mass

Steel grade		C	Si	Mn	P	S	Cr [b]	Mo [b]	Ni [b]	Al tot	Cu [b c]	Nb [b]	Ti [b]	V [b]	Cr+Cu+Mo+Ni [b]
Steel name	Steel number	max.	max.	max.	Max.	max.	max.	max.	max.	min.	max.	max.	max.	max.	max.
P195TR1	1.0107	0,13	0,35	0,70	0,025	0,020	0,30	0,08	0,30	-	0,30	0,010	0,04	0,02	0,70
P195TR2	1.0108	0,13	0,35	0,70	0,025	0,020	0,30	0,08	0,30	0,02 [d]	0,30	0,010	0,04	0,02	0,70
P235TR1	1.0254	0,16	0,35	1,20	0,025	0,020	0,30	0,08	0,30	-	0,30	0,010	0,04	0,02	0,70
P235TR2	1.0255	0,16	0,35	1,20	0,025	0,020	0,30	0,08	0,30	0,02 [d]	0,30	0,010	0,04	0,02	0,70
P265TR1	1.0258	0,20	0,40	1,40	0,025	0,020	0,30	0,08	0,30	-	0,30	0,010	0,04	0,02	0,70
P265TR2	1.0259	0,20	0,40	1,40	0,025	0,020	0,30	0,08	0,30	0,02 [d]	0,30	0,010	0,04	0,02	0,70

[a] Elements not included in this Table shall not be intentionally added to the steel without the agreement of the purchaser, except for elements which may be added for finishing the cast. All appropriate measures shall be taken to prevent the addition of undesirable elements from scrap or other materials used in the steelmaking process.

[b] The content of these elements need not be reported unless intentionally added to the cast.

[c] ***Option 2***:*In order to facilitate subsequent forming operation, an agreed maximum copper content lower than indicated and an agreed specified maximum tin content shall apply.*

[d] This requirement is not applicable provided the steel contains a sufficient amount of other nitrogen binding elements which shall be reported.