SLOVENSKI STANDARD
SIST EN 10272:2016

01-oktober-2016

Nadomešča:
SIST EN 10272:2007

Nerjavne jeklene palice za tlačne posode

Stainless steel bars for pressure purposes

Stäbe aus nichtrostendem Stahl für Druckbehälter

Barres en acier inoxydable pour appareils à pression

Ta slovenski standard je istoveten z: **EN 10272:2016**

ICS:

77.140.20	Visokokakovostna jekla	Stainless steels
77.140.30	Jekla za uporabo pod tlakom	Steels for pressure purposes
77.140.60	Jeklene palice in drogovi	Steel bars and rods

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EUROPEAN STANDARD

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English Version

Stainless steel bars for pressure purposes

Barres en acier inoxydable pour appareils à pression

Stäbe aus nichtrostendem Stahl für Druckbehälter

This European Standard was approved by CEN on 15 April 2016.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 2016-07-27.

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

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European foreword

This document (EN 10272:2016) has been prepared by Technical Committee ECISS/TC 107 “Steels for pressure purposes”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2017, and conflicting national standards shall be withdrawn at the latest by January 2017.

This document supersedes EN 10272:2007.

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.

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Introduction

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning two steel grades given in 10.2, Annex A and Annex B.

CEN takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured CEN that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with CEN. Information may be obtained from:

Outokumpu OYJ

FI – 02200 Espoo, Finland

for steel grades 1.4162 and 1.4662

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1 Scope

This European Standard specifies the technical delivery conditions for hot and cold formed stainless steel bars for the construction of pressure equipment supplied in accordance with one of the process routes and surface finishes listed in Table 6.

The general technical delivery conditions in EN 10021 also apply.

NOTE Once this European Standard is published in the Official Journal of the European Union (OJEU) under Directive 2014/68/EU, presumption of conformity to the Essential Safety Requirements (ESRs) of Directive 2014/68/EU is limited to technical data of materials in this European Standard and does not presume adequacy of the material to a specific item of 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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10020:2000, *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 10052:1993, *Vocabulary of heat treatment terms for ferrous products*

EN 10058, *Hot rolled flat steel bars for general purposes — Dimensions and tolerances on shape and dimensions*

EN 10059, *Hot rolled square steel bars for general purposes — Dimensions and tolerances on shape and dimensions*

EN 10060, *Hot rolled round steel bars for general purposes — Dimensions and tolerances on shape and dimensions*

EN 10061, *Hot rolled hexagon steel bars for general purposes — Dimensions and tolerances on shape and dimensions*

EN 10079:2007, *Definition of steel products*

EN 10088-1:2014, *Stainless steels — Part 1: List of stainless steels*

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

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

EN 10221:1995, *Surface quality classes for hot-rolled bars and rods — Technical delivery conditions*

EN 10278, *Dimensions and tolerances of bright steel products*

EN 10308, *Non destructive testing — Ultrasonic testing of steel bars*

EN ISO 148-1:2010, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2009)*

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

EN ISO 3651-2, *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)*

EN ISO 6506-1, *Metallic materials - Brinell hardness test — Part 1: Test method (ISO 6506-1)*

EN ISO 6892-1:2009, *Metallic materials - Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2009)*

EN ISO 6892-2:2011, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature (ISO 6892-2:2011)*

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

ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*

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

3 Terms and definitions

For the purpose of this document the terms and definitions given in EN 10020:2000, EN 10052:1993, EN 10079:2007, EN 10088-1:2014 and the following apply.

3.1
purchaser
person or organization that orders products in accordance with this European Standard

Note 1 to entry: The purchaser is not necessarily, but may be, a manufacturer of pressure equipment.

3.2
cryogenic temperature
temperature lower than –75 °C used in the liquefaction of gases

4 Dimensions and tolerances on dimensions

The nominal dimensions and tolerances on dimensions shall be agreed at the time of enquiry and order with reference to the relevant dimensional standard EN 10058, EN 10059, EN 10060, EN 10061, EN 10278 or ISO 286-1. If the relevant standard offers the purchaser certain options, e.g. regarding tolerance classes, specific information on these aspects shall additionally be given.

5 Calculation of mass

When calculating the nominal mass from the nominal dimensions the values given in EN 10088-1 shall be used as a basis for the density of the steel concerned.

6 Classification and designation

6.1 Classification

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

— ferritic steels;

— martensitic steels;

— austenitic steels;

— austenitic-ferritic (duplex) steels.

NOTE For more details see EN 10088–1.

6.2 Designation

The steel grades are designated with steel names in accordance with EN 10027-1. The corresponding steel numbers have been allocated in accordance with EN 10027-2.

7 Information to be supplied by the purchaser

7.1 Mandatory information

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

a) quantity to be delivered (mass, length, number of pieces);

b) shape of bar;

c) nominal dimensions of the product;

d) number of the standard specifying the tolerances on dimensions, shape and mass (see Clause 4 and Clause 5);

e) number of this European Standard, i.e. EN 10272;

f) steel name or steel number;

g) delivery condition (see 8.2);

h) process route and surface finish (see Table 6);

i) type of inspection certificate in accordance with EN 10204 (see 9.1.1).

7.2 Options

A number of options are specified in this document 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 product shall be supplied in accordance with the basic specifications (see 7.1).

1) specification of the steelmaking process (see 8.1);

2) tighter carbon ranges for martensitic steels (see Table 2, footnote b);

3) specification of a controlled sulfur content (see Table 2, footnote c or Table 3, footnote b);

4) verification of resistance to intergranular corrosion (see 8.4, 9.6.4.1 and Table 14);

5) verification of tensile properties at elevated temperature (see 8.5.2, 9.6.2.2 and Table 14);

6) verification of product analysis (see 9.6.1 and Table 14);

7) test temperature for the tensile test at elevated temperature (see 9.6.2.2);

8) verification of impact properties of austenitic steels at room temperature (see 8.5.1, 9.6.3 and Table 14);

9) verification of impact properties at low temperature (see 8.5.1, 9.6.3 and Table 14);

10) special requirements on surface quality (see 8.6);

11) verification of internal soundness (see 8.7 and Table 14);

12) verification of the hardness (see 9.6.4.2 and Table 14);

13) special marking requirements (see 10.2).

7.3 Example of ordering

10 t rounds of 50 mm diameter, dimensional tolerances as specified in EN 10060 made of the steel grade X5CrNi18-10 (1.4301) as specified in EN 10272 to process route 1D (see Table 6), inspection certificate 3.1 as specified in EN 10204:

10 t rounds EN 10060–50– steel EN 10272–X5CrNi18-10+1D–inspection certificate 3.1

or

10 t rounds EN 10060–50– steel EN 10272–1.4301+1D–inspection certificate 3.1

8 Requirements

8.1 Steelmaking process

Unless a special steelmaking process is agreed at the time of enquiry and order, the steelmaking process shall be at the discretion of the manufacturer.

8.2 Delivery condition

The products shall be supplied in the delivery condition specified in the order by reference to the process route given in Table 6 and, where different alternatives exist; to the treatment conditions given in Tables 7 to 9. Guidelines for further heat treatment are given in Annex A.

8.3 Chemical composition

8.3.1 The cast analysis reported by the steel producer shall apply and comply with the requirements of Tables 2 to 4.

8.3.2 The product analysis shall not deviate from the limiting values for the cast analysis as specified in Tables 2 to 4 by more than the values given in Table 5.

8.4 Corrosion resistance

Referring to resistance to intergranular corrosion as defined in EN ISO 3651-2, for austenitic and austenitic-ferritic steels the specifications in Tables 8 and 9 apply.

NOTE 1 EN ISO 3651-2 is not applicable for testing martensitic steels.

NOTE 2 The corrosion resistance of stainless steels is strongly dependent on the type of environment and can therefore not always be clearly ascertained through laboratory tests. It is therefore advisable to draw on the available experience of the use of the steels.

8.5 Mechanical properties

8.5.1 The tensile properties at room temperature and the impact energy at 20 °C and at low temperatures as specified in Tables 7 to 9 apply for the relevant specified heat treatment condition.

NOTE Austenitic steels are insensitive to brittle fracture in the solution annealed condition because they do not have a pronounced transition temperature, which is characteristic for other steels, they are also useful for application at cryogenic temperatures (see also the NOTE to Tables 8 and 9).

8.5.2 The values in Tables 10 to 12 apply for the 0,2 % and, Table 11 only, additionally for the 1,0 %-proof strength at elevated temperatures. For austenitic steels, the values given in Table 13 apply for the tensile strength at elevated temperatures.

8.5.3 Tensile strength values at elevated temperatures for austenitic-ferritic steels are given for guidance in Table B.1.

8.5.4 For creep rupture strength values of the grade X6CrNi25-20, see Table C.1.

8.6 Surface quality

The surface quality shall be according to agreed surface finish in Table 6.

Slight surface imperfections, inherent in the production process, are permitted.

If more exact requirements for the surface quality are necessary, these shall be agreed at the time of enquiry and order, where appropriate, on the basis of EN 10221:1995.

8.7 Internal soundness

The products shall be sound and free from defects that preclude their intended use.

Where appropriate, requirements together with the conditions for their verification (see 9.6.4.5 and Table 14) may be agreed at the time of enquiry and order.

8.8 Weldability

The choice of the appropriate welding method and parameters are under the responsibility of the equipment manufacturer.

NOTE Inappropriate post weld heat treatment (PWHT) conditions may decrease the mechanical properties. It is therefore recommended that the purchaser seeks, at the time of enquiry and order, the advice of the manufacturer and considers, where appropriate, the verification of the mechanical properties on simulated post weld heat treated samples.

8.9 Physical properties

Data concerning the physical properties of steels covered by this standard are stated in EN 10088-1:2014, Annex E.

9 Inspection

9.1 Types of inspection and inspection documents

9.1.1 The compliance with the requirements of the order shall be checked for products in accordance with this European Standard by specific inspection.

The purchaser shall specify the required type of inspection document (3.1 or 3.2) in accordance with EN 10204:2004.

If an inspection document 3.1 is specified, the manufacturer shall operate a quality assurance system, certified by a competent Body established as legal entity within the European Union and having undergone a specific assessment for materials.

If an inspection certificate 3.2 is specified, the purchaser shall notify the manufacturer of the name and address of the organization or person who is to carry out the inspection and produce the inspection document. It shall also be agreed which party shall issue the certificate.

9.1.2 The inspection certificate 3.1 or 3.2 shall include, in accordance with EN 10168:2004, the following codes and information:

A	Commercial transactions and parties involved;
B	Description of products to which the inspection certificate applies (including tempering temperature in the case of quenched and tempered or tempered products);
C03	Test temperature;
C10-C13	Tensile test at room temperature and, if applicable, at elevated temperatures;
C40-C43	Impact test, if applicable;
C50-C69	Hardness test, if applicable;
C70	Steelmaking process;
C71-C92	Cast analysis and, if applicable, product analysis;
D01	Marking and dimensional checking and, if applicable, verification of the surface quality;
D02-D99	Non-destructive tests, if applicable;
Z	Validation.

9.2 Tests to be carried out

The mandatory and optional tests to be carried out and the extent of testing are specified in Table 14.

9.3 Frequency of testing

The composition and size of test units and the number of samples and test pieces are specified in Table 14.

9.4 Re-tests, sorting and reprocessing

For retests, sorting and reprocessing the requirements of EN 10021 shall apply.