SLOVENSKI STANDARD

SIST EN 10272:2001

01-november-2001

Nerjavne jeklene palice za tlaļne posode

Stainless steel bars for pressure purposes

Nichtrostende Stäbe für Druckbehälter

Barres en acier inoxydable pour appareils a pression

Ta slovenski standard je istoveten z: EN 10272:2000

ICS:

77.140.30	Jekla za uporabo pod tlakom	Steels for pressure purposes
77.140.60	Jeklene palice in drogovi	Steel bars and rods

SIST EN 10272:2001 **en**

EUROPEAN STANDARD

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ICS 77.140.20; 77.140.30; 77.140.60

English version

Stainless steel bars for pressure purposes

Barres en acier inoxydable pour appareils à pression

Nichtrostende Stäbe für Druckbehälter

This European Standard was approved by CEN on 15 September 2000.

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 Central Secretariat 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 Central Secretariat 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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 10272:2000 E

Contents

Foreword

This European Standard has been prepared by Technical Committee ECISS/TC 22 "Steels for pressure purposes - Qualities" and ECISS/TC 23/SC 1 "Stainless steels", the secretariats of which are held by Normenausschuß Eisen und Stahl (FES) im 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of an identical text or by endorsement, at the latest by April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

This European Standard 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 standard.

Annex D contains national A-deviations specifying the restrictions for the application of this European Standard in Sweden.

NOTE The clauses marked with a point (●) contain information relating to agreements which are to be made at the time of ordering. The clauses marked with two points (●●) contain information relating to agreements which may be made at the time of enquiry and order.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

1.1 This European Standard specifies the technical delivery conditions for hot and cold formed stainless steel bars for pressure purposes supplied in accordance with one of the process routes and surface finishes listed in Table 5.

1.2 The general technical delivery conditions specified in EN 10021 apply in addition to the specifications of this European Standard, unless otherwise specified in this European Standard.

2 Normative references

This European Standard incorporates by dated 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 dated references, subsequent amendments to or revisions 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).

EN 10002-1, *Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature) "including Addendum AC1:1990"*

EN 10002-5, *Metallic materials - Tensile testing - Part 5: Method of test at elevated temperature*

EN ISO 6506-1, *Metallic materials - Brinell hardness test - Part 1: Test method (ISO 6506-1:1999)*

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

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

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

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

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

EN 10079, *Definition of steel products*

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

EN 10204, *Metallic products - Types of inspection documents (includes amendment A1:1995)*

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

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

prEN 10168:2000, *Iron and steel products - Inspection documents - List of information and description*

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 3651-2:1998)*

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

See also Annex C.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 10052, EN 10079, EN 10088-1 and the following shall apply.

3.1
purchaser
person or organization that orders products in accordance with this standard. The purchaser is not necessarily, but may be, a manufacturer of pressure equipment in accordance with the EU Directive listed in Annex ZA. Where a purchaser has responsibilities under this EU Directive, this standard will provide a presumption of conformity with the essential requirements of the Directive so identified in Annex ZA.

4 ● Dimensions and tolerances on dimensions

The dimensions and the tolerances on dimensions are to be agreed at the time of enquiry and order, as far as possible with reference to the dimensional standards listed in Annex C.

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 Designation

The steel names are allocated in accordance with EN 10027-1; the steel numbers are allocated in accordance with EN 10027-2.

7 Information to be supplied by the purchaser

7.1 Mandatory information

The complete order of a product as specified in this European Standard shall include the following information:

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

b) the shape of bar;

c) the number of the European Standard specifying the tolerances on dimensions, shape and mass (see clause 4) and, if the relevant European Standard permits the purchaser certain options, e.g. regarding tolerance classes, specific information on these aspects;

d) the dimensions and tolerances on dimensions and shape;

e) the number of this European Standard;

f) the steel name or the steel number;

g) the delivery condition (see 9.2);

h) the process route and surface finish (see Table 5);

i) the type of inspection document in accordance with EN 10204 (see 10.2.1).

EXAMPLE 10 t rounds of a steel grade with the name X5CrNi18-10 and the number 1.4301 as specified in EN 10272 of 50 mm diameter, dimensional tolerances as specified in prEN 10060:2000, in process route 1D (see Table 5), inspection document 3.1.B as specified in EN 10204:

10 t rounds prEN 10060:2000 60-50
EN 10272-X5CrNi18-10+1D
Inspection document 3.1.B

or

10 t rounds prEN 10060:2000 60-50
EN 10272-1.4301+1D
Inspection document 3.1.B

7.2 Options

A number of options are specified in this European Standard and these are listed below. If the purchaser does not indicate his wish to implement any of these options marked with 2 points (●●) at the corresponding subclauses, the supplier shall supply in accordance with the basic specification of this standard (see 7.1).

a) specification of the steelmaking process (see 9.1);

b) verification of product analysis (see 9.3.2 and Table 13);

c) verification of tensile properties at elevated temperature (see 9.5.2, 10.6.3 and Table 13);

d) verification of impact properties of austenitic steels at room temperature (see 9.5.1, 10.6.4 and Table 13);

e) verification of impact properties at low temperature (see 9.5.1, 10.6.4 and Table 13);

f) verification of resistance to intergranular corrosion (see 9.4, 10.6.5 and Table 13);

g) special requirements on surface quality (see 9.6);

h) verification of internal soundness (see 9.7);

i) specific tests for verification of general delivery requirements (see 10.1);

j) special marking requirements (see 11.2).

8 Classification of grades

Steels covered by this European Standard 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.

9 Requirements

9.1 ●● Steelmaking process

Unless a special steelmaking process is agreed at the time of enquiry and order, the steelmaking process for steels in accordance with this European Standard shall be at the discretion of the manufacturer.

9.2 ● Delivery condition

The products shall be supplied in the delivery condition agreed in the order by reference to the process route given in Table 5 and, where different alternatives exist, to the treatment conditions given in Tables 6 to 8 (see also annex A).

9.3 Chemical composition

9.3.1 The chemical composition requirements given in Tables 1 to 3 apply in respect of the chemical composition according to the cast analysis.

9.3.2 ●● The product analysis shall not deviate from the limiting values for the cast analysis as specified in Tables 1 to 3 by more than the values given in Table 4.

9.4 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 7 and 8 apply.

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

NOTE 2 The corrosion resistance of stainless steels is very 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.

9.5 Mechanical properties

9.5.1 The tensile properties at room temperature and the impact energy at room and at low temperatures as specified in Tables 6 to 8 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 of other steels they are also useful for application at cryogenic temperatures.

9.5.2 The values in Tables 9 to 11 apply for the 0,2 % and, Table 10 only, for the 1 % proof strength at elevated temperatures. For austenitic steels, the values given in Table 12 apply for the tensile strength at elevated temperatures.

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

9.6 ●● Surface quality

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.

9.7 ●● Internal soundness

For the internal soundness, where appropriate, requirements together with the conditions for their verification shall be agreed at the time of enquiry and order.

10 Testing

10.1 ●● General

The manufacturer shall carry out appropriate process control, inspection and testing to assure himself that the delivery complies with the requirements of the order.

This includes the following:

— a suitable frequency of verification of the dimensions of the products;

— an adequate intensity of visual examination of the surface quality of the products;

— an appropriate frequency and type of test to ensure that the correct grade of steel is used.

The nature and frequency of these verifications, examinations and tests are determined by the manufacturer, in the light of the degree of consistency that has been determined. In view of this, verifications by specific tests for these requirements are not necessary unless otherwise agreed.

10.2 Type and content of inspection documents

10.2.1 ● 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 type of inspection document according to EN 10204 at the time of enquiry and order.

10.2.2 The inspection document shall contain, in accordance with prEN 10168:2000, the following information:

a) the information blocks A, B and Z; the tempering temperature shall also be given in the case of quenched and tempered products;

b) the results of the cast analysis in accordance with boxes C 71 to C 92;

c) the results of the tensile test at room temperature in accordance with boxes C 00 to C 03 and C 10 to C 13;

d) except for austenitic steels, the results of the impact test at room temperature in accordance with boxes C 00 to C 03 and C 40 to C 43;

e) the result of the visual examination of the products (see information Block D);

f) if one or several of the following options have been agreed at the time of enquiry and order, the relevant information on

1) the steelmaking process (section C 70);

2) the product analysis in accordance with boxes C 71 to C 92;

3) verification of the tensile properties at elevated temperature in accordance with boxes C 00 to C 03, C 10 and C 11;

4) verification of impact properties of austenitic steels at room temperature in accordance with boxes C 00 to C 03 and C 40 to C 43;

5) verification of impact properties at low temperature in accordance with boxes C 00 to C 03 and C 40 to C 43;

6) verification of resistance to intergranular corrosion (see information Block D);