



SLOVENSKI STANDARD

SIST EN 10294-2:2012

01-maj-2012

Votle palice za strojno obdelavo - Tehnični dobavni pogoji - 2. del: Nerjavna jekla s specificiranimi obdelovalnimi lastnostmi

Hollow bars for machining - Technical delivery conditions - Part 2: Stainless steels with specified machinability properties

Stahlrohre für die spanende Bearbeitung (Drehteilrohre) - Technische Lieferbedingungen - Teil 2: Nichtrostende Stähle mit spezifizierten Zerspanungseigenschaften

Barres creuses pour usinage - Conditions techniques de livraison - Partie 2: Aciers inoxydables à usinabilité spécifiée

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ICS:

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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EN 10294-2

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Hollow bars for machining - Technical delivery conditions - Part 2: Stainless steels with specified machinability properties

Barres creuses pour usinage - Conditions techniques de
livraison - Partie 2: Aciers inoxydables à usinabilité
spécifiée

Stahlrohre für die spanende Bearbeitung (Drehteilrohre) -
Technische Lieferbedingungen - Teil 2: Nichtrostende
Stähle mit spezifizierten Zerspanungseigenschaften

This European Standard was approved by CEN on 16 December 2011.

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.

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

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EN 10294-2:2012 (E)**Foreword**

This document (EN 10294-2:2012) has been prepared by Technical Committee ECISS/TC 110 “Steel tubes, and iron and steel fittings”, 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of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document differs from ISO 2938, *Hollow bars for machining*.

EN 10294 consists of the following parts, under the general title *Hollow bars for machining — Technical delivery conditions*:

- Part 1: Non alloy and alloy steels;
- Part 2: Stainless steels with specified machinability properties.

Another European Standard series covering tubes for mechanical and general engineering purposes are:

- EN 10297, *Seamless circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions*
- EN 10296, *Welded circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions*.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This part of EN 10294 specifies the technical delivery conditions for seamless hollow bars made of austenitic (including creep resisting steels) and austenitic-ferritic (duplex) stainless steels, with specified machinability properties, intended for the manufacture of engineering components by machining.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 10052, *Vocabulary of heat treatment terms for ferrous products*

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*

CEN/TR 10261, *Iron and steel — Review of available methods of chemical analysis*

EN 10266, *Steel tubes, fittings and structural hollow sections — Symbols and definitions 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)*

EN ISO 2566-2, *Steel — Conversion of elongation values — Part 2: Austenitic steels (ISO 2566-2)*

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 sulphuric acid (ISO 3651-2)*

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

EN ISO 10893-10, *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)*

ISO 3685, *Tool-life testing with single-point turning tools*

EN 10294-2:2012 (E)**3 Terms and definitions**

For the purpose of this document, the terms and definitions given in EN 10021, EN 10052 and EN 10266 and the following apply.

3.1 hollow bar
circular hollow product for machining made by a seamless tube manufacturing process or by drilling a bore into a rolled or forged bar

3.2 guaranteed cutting speed
lowest cutting speed guaranteed by the manufacturer to obtain a specified minimum tool-life time with a fixed set of machining parameters for a certain steel grade

3.3 centring on the outside diameter
first chucking is made on the outside diameter and machining is performed on the outside surface and/or on the inside surface

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4 Symbols

In addition to (or deviating from) the symbols defined in EN 10266 the following symbols apply:

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D Outside diameter; <https://standards.iteh.ai/catalog/standards/sist/f7fc1814-ea11-4e1d-b7bf-d11fcca7b0be/sist-en-10294-2-2012>

d Inside diameter;

$D_{(e)}$ Maximum achievable outside diameter when centring on the outside diameter;

$d_{(e)}$ Minimum achievable inside diameter when centring on the outside diameter;

$D_{(i)}$ Maximum achievable outside diameter when centring on the inside diameter;

$d_{(i)}$ Minimum achievable inside diameter when centring on the inside diameter;

T_N Nominal wall thickness, calculated as the half difference between the nominal outside diameter D and the nominal inside diameter d ;

v_c (Velocity cutting) Cutting speed.

5 Classification and designation

5.1 Classification

According to the classification system in EN 10020 and to their structure, the steel grades in this European Standard are classified as:

- austenitic stainless steels (corrosion resisting or creep resisting steels);
- austenitic-ferritic (duplex) stainless steels.

For more details see EN 10088-1.

5.2 Designation

For hollow bars covered by this part of this European Standard the steel designation consists of:

- the number of this part of this European Standard (EN 10294-2);

plus either:

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

or:

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

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6 Information to be supplied by the purchaser

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6.1 Mandatory information

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

- a) quantity (mass or total length or number);
- b) term "hollow bar";
- c) hollow bar size code (outside diameter and inside diameter);
- d) reference to this European Standard (EN 10294-2);
- e) steel designation (steel name or steel number) (see 5.2);
- f) mechanical properties for tubes with wall thicknesses $T_N > 50$ mm.

6.2 Options

A number of options are specified in this European Standard 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 hollow bars shall be supplied in accordance with the basic specification (see 6.1).

- a) product analysis (see 8.2.2);
- b) corrosion resistance (see 8.4);

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- c) specify the machinability with reference to the Taylor method (specification of constants α and C) (see 8.5);
- d) special requirements on surface condition, either outside or inside, as specified by the purchaser (see 8.6.1);
- e) non-destructive testing (see 8.6.2);
- f) other dimensional requirements (see 8.9.1);
- g) exact lengths (see 8.9.3).

6.3 Example of an order

50 tonnes of hollow bars, 140 mm outside and 90 mm inside diameter, in accordance with EN 10294-2, made of steel grade 1.4307 (X2CrNi18-9):

50 t hollow bars – 140 X 90 – EN 10294-2 – 1.4307

or

50 t hollow bars – 140 X 90 – EN 10294-2 – X2CrNi18-9

7 Manufacturing process

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7.1 Material making process

The steels covered by this European Standard are characterized by their suitability for machining (see 8.5). The material making process is left at the discretion of the manufacturer provided all requirements defined in Clause 8 can be fulfilled with the material produced.

7.2 Manufacturing and delivery conditions**7.2.1 Manufacturing**

The hollow bars shall be made by a seamless process or by drilling from round bars. At the discretion of the manufacturer the hollow bars may be hot finished or cold finished. The terms "hot finished" and "cold finished" apply to the condition of the hollow bar before it is heat treated in accordance with 7.2.2.

7.2.2 Delivery conditions

The hollow bars shall be supplied in the solution annealed condition over their full length in either:

- reference heat treatment conditions;
- solution annealed condition obtained directly by extrusion and subsequent rapid cooling provided the mechanical properties, corrosion resistance and other properties are in accordance with this European Standard. All specified mechanical properties shall be met even after a subsequent reference heat treatment.

8 Requirements

8.1 General

The hollow bars, when supplied in the delivery condition in 7.2.2 and inspected in accordance with Clause 9, Clause 10 and Clause 11, shall comply with the requirements of this part of this European standard.

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 material manufacturer shall apply and comply with the requirements of Tables 1 and 2.

8.2.2 Product analysis

In case of dispute the permissible deviations of a product analysis from the limits of cast analysis specified in Tables 1 and 2 are given in Table 3.

Option a: *Product analysis shall be supplied.*

NOTE When welding hollow bars produced according to this European Standard, account shall 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 material thickness and the conditions of preparing for and carrying out welding.

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