SLOVENSKI STANDARD
oSIST prEN 10340-2:2019

01-julij-2019

Jekleni ulitki za uporabo v gradbeništvu - 2. del: Tehnični dobavni pogoji

Steel castings for structural uses - Part 2: Technical delivery conditions

Stahlguss für das Bauwesen - Teil 2: Technische Lieferbedingungen

Aciers moulés de construction - Partie 2: Conditions techniques de livraison

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Ta slovenski standard je istoveten z: **prEN 10340-2**

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ICS:

77.140.80 Železni in jekleni ulitki Iron and steel castings

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 10340-2

May 2019

ICS 77.140.80

Will supersede EN 10340:2007

English Version

Steel castings for structural uses - Part 2: Technical delivery conditions

Aciers moulés de construction - Partie 2: Conditions techniques de livraison

Stahlguss für das Bauwesen - Teil 2: Technische Lieferbedingungen

This draft European Standard is submitted to CEN members for second enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 11.

If this draft becomes a European Standard, 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (prEN 10340-2:2019) 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 document is currently submitted to the second CEN Enquiry.

This document together with prEN 10340-1 will supersede EN 10340:2007, which was impacted by EN 10340:2007/AC:2008.

EN 10340, *Steel castings for structural uses*, consists of the following parts:

— *Part 1: General* (current at Enquiry stage);

— *Part 2: Technical delivery conditions* (this document).

In comparison with EN 10340:2007 and EN 10340:2007/AC:2008, the following significant changes were made:

— alignment with the specifications of prEN 10340-1;

— new grades were added.

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1 Through its sub-committee SC 11 “Steel castings and forgings” (secretariat: AFNOR).

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1 Scope

prEN 10340-2, in addition to prEN 10340-1, specifies technical delivery conditions for steel castings for structural uses in buildings and civil engineering works.

In cases where castings are joined by welding by the founder, prEN 10340-2 applies.

prEN 10340-2 does not apply in cases where castings are welded:

— to wrought products (plates, tubes, forgings, etc.); or

— by non-founders.

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 1559-1, *Founding – Technical conditions of delivery – Part 1: General*

EN 1559-2:2014, *Founding – Technical conditions of delivery – Part 2: Additional requirements for steel castings*

prEN 10340-1, *Steel castings for structural uses – Part 1: General*

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

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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)*

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

EN ISO 8062-3, *Geometrical Product Specifications (GPS) – Dimensional and geometrical tolerances for moulded parts – Part 3: General dimensional and geometrical tolerances and machining allowances for castings (ISO 8062-3)*

EN ISO 11970:2016, *Specification and qualification of welding procedures for production welding of steel castings (ISO 11970:2016)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1559-1 and EN 1559-2 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

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4 Information to be supplied by the purchaser

4.1 Mandatory information

In addition to EN 1559-1, the relevant wall thickness shall be given in the order.

In cases of grades with different mechanical properties relating to heat treatment conditions, the manufacturer shall obtain from the purchaser the heat treatment symbol in accordance with Clause 5.

4.2 Optional information

In addition to EN 1559-1, for specific uses, some optional requirements may become mandatory according to the product standards.

5 Designation

For a steel grade which can be delivered to different strength levels, according to the heat treatment, a suffix shall be added in accordance with Table 2. For example: G24Mn6+QT1.

6 Manufacture

6.1 Manufacturing process

6.1.1 Melting

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The steel or alloy shall be produced by an electric melting process or by any other process involving secondary refining.

6.1.2 Heat treatment

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Unless otherwise agreed, the type of heat treatment represented by its symbol shall comply with Table 2. For some grades, there are different options with different mechanical properties given in Table 2.

If required, the purchaser shall be informed of the heat treatment conditions.

6.2 Welding operations

6.2.1 General

Specification given in EN 1559-1 shall apply.

6.2.2 Production welding

In addition to EN 1559-1, major production welds may be reported by indicating their location and extent in the form of drawings, sketches or photographs.

If agreed between the manufacturer and the purchaser, the documents related to the production welding shall be supplied to the purchaser.

Unless otherwise specified, welding is permitted, provided that all welds shall comply with the same criteria for non-destructive testing as the relevant part of the casting and shall be carried out according to a qualified welding procedure (see EN ISO 11970).

Conditions for preheating, interpass, postweld heat-treatment and welding groups related to welding operations are given in Annexes A and B.

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7 Requirements

7.1 General

Specification given in EN 1559-1 shall apply.

7.2 Material

7.2.1 Chemical composition

In addition to EN 1559-2:

— the chemical composition determined by a cast analysis shall conform to the values given in Table 1;

— elements unspecified in Table 1 of this document shall not be intentionally added without agreement of the purchaser other than for the purpose of finishing the heat;

— permissible deviations between the specified cast analysis and the product analysis are indicated in EN 1559-2:2014, Table 1.

7.2.2 Mechanical properties

In addition to EN 1559-2:

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The mechanical properties shall comply with the values given in Table 2.

These values shall apply up to the maximum wall thickness given in Table 2. They shall be verified on test blocks of relevant thickness (see EN 1559-2). In all cases, the maximum relevant thickness of test blocks shall be limited to 150 mm.

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The yield strength values at room temperature correspond to 0,2 % proof strength ($R_{p0,2}$).

In cases where two impact energy values are given, for different test temperatures in Table 2 the manufacturer shall ascertain from the purchaser which impact energy value is required. If there is no specified requirement, impact test shall be conducted at room temperature.

7.2.3 Other properties

Other material properties may be specified, such as corrosion resistance, creep resistance, structure or specific physical properties.

7.3 Casting

7.3.1 Chemical composition

When a chemical analysis is required to be carried out on a casting, the permissible deviations shall conform to those given in EN 1559-2:2014, Table 1. When applicable, the sampling position shall be agreed between the purchaser and the manufacturer.

7.3.2 Mechanical properties

When particular properties, e.g. yield strength, tensile strength, hardness, apply to certain areas of the casting or to the complete casting, these properties shall be agreed by the time of the order. In such cases, additionally, the position, the shape of the sample, the sampling conditions and the acceptance criteria shall be agreed between the purchaser and the manufacturer.

In addition to EN 1559-2, the values of yield and tensile strength given in Table 2 also apply to the casting itself up to the maximum relevant wall thickness stated.

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7.3.3 Outer and inner conditions (non-destructive testing)

Specification given in EN 1559-2 shall apply.

7.3.4 Conditions of the casting

Specification given in EN 1559-2 shall apply.

7.3.5 Mass of the casting

Specification given in EN 1559-2 shall apply.

7.3.6 Additional requirements regarding the condition of the casting

Specification given in EN 1559-2 shall apply.

7.4 Corrosion behaviour

Corrosion behaviour can be improved by applying an appropriate surface treatment (e.g. specific coating, passivation).

Requirements for resistance to intergranular corrosion may be agreed between producer and purchaser for austenitic and austenitic-ferritic grades (see EN ISO 3651-2).

8 Inspection

8.1 General

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Specification given in EN 1559-1 shall apply.

8.2 Type of inspection documents and type of inspection

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Specification given in EN 1559-1 shall apply.

8.3 Test unit

8.3.1 Formation of test units

In addition to EN 1559-1, other test units can be defined by agreement between the manufacturer and the purchaser.

8.3.2 Size of test units

The size of test units shall be specified in the order.

8.3.3 Inspection frequency

The inspection frequency shall be in accordance with EN 1559-2.

8.4 Samples

In addition to EN 1559-1, mechanical properties shall be measured on test pieces taken from test blocks, up to a maximum block wall thickness of 150 mm.

The test block thickness shall not exceed 150 mm, even when the characteristics specified in the product standard are given for a thickness greater than 150 mm.

Each test piece shall be taken from the test blocks as follows:

— if the section thickness is ≤ 28 mm the axis of the test piece shall be equidistant from the cast surfaces;

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— if the section thickness is greater than 28 mm and up to 56 mm, the axis of the test piece shall be at 14 mm from the cast surface;

— if the section thickness is greater than 56 mm, the axis of the test piece shall be at least one quarter thickness from the cast surface.

By agreement, the test blocks can be separately cast, gated-on or cast integral: in these cases, they are directly filled through the casting and their filling conditions can be defined.

The geometry of test blocks can be agreed at the time of enquiry and order. It can be selected as follows:

a) test block t x t:

1) the cross section of the test block is t x t (where t is the relevant wall thickness) ;

b) test block t x 3t x 3t:

1) when the relevant wall thickness is greater than 56 mm, the dimensions of the test block may be taken as: t x 3t x 3t (where t is the relevant wall thickness). The position of test pieces shall be as shown in EN 1559-2:2014, Figure 1.

8.5 Test procedures

8.5.1 Tensile test at room temperature

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In addition to EN 1559-1, the test method for the tensile test at room temperature shall be in accordance with EN ISO 6892-1. The initial gauge length shall be $L_0 = 5,65\sqrt{S_0}$ where S_0 is the cross section of the test piece.

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8.5.2 Impact test

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The shape and dimensions of the test piece (V-notch) and test method shall be according to EN ISO 148-1. The absorbed energy value is defined as KV_2 in Joules to be determined by three test pieces at the temperature given in Table 2.

The average value of energy shall not be smaller than the specified value indicated in Table 2 for the specified grade; one of the individual values may be smaller than specified, provided that it is not smaller than 70 % of this specified value.

8.5.3 Ferrite content test (applicable to austenitic and austenitic-ferritic- grades)

The ferrite content can be determined either:

— by calculation using the chemical composition of the material; or

— by calculation using the chemical composition of the product, after testing at a location agreed at the time of enquiry and order.

8.5.4 Homogeneity of test units (hardness test)

The homogeneity of the test units shall be verified on a percentage of castings and with a hardness range to be agreed. The hardness shall be tested at the same location on each casting.

NOTE Hardness can be determined as Brinell hardness, in accordance with EN ISO 6506-1.