SLOVENSKI STANDARD
SIST EN 16482:2024

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Livarstvo - Palice iz litega železa

Founding - Continuous cast iron bars

Gießereiwesen - Gusseisen-Strangguss

Fonderie - Barres de fonte par coulée continue

Ta slovenski standard je istoveten z: **EN 16482:2024**

ICS:

77.140.80 Železni in jekleni ulitki Iron and steel castings

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Founding - Continuous cast iron bars

Fonderie - Barres de fonte par coulée continue

Gießereiwesen - Gusseisen-Strangguss

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16482:2024) has been prepared by Technical Committee CEN/TC 190 “Foundry technology”, 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of an identical text or by endorsement, at the latest by January 2025, and conflicting national standards shall be withdrawn at the latest by January 2025.

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

This document supersedes EN 16482:2014.

The following modifications were implemented in this new edition:

— new normative references;

— new reference to ASTM A536-84 (2009), *Standard Specification for Ductile Iron Castings* in the text and Bibliography;

— modification of Table 2 “Tensile properties of continuous cast spheroidal graphite cast iron bars”, where two Grades were modified to fulfil requirements also of ASTM A536-84 (2009): EN-GJS-450-12C and EN GJS 550-6C;

— new Table 4 “Minimum impact energy values measured on V-notched test pieces machined from cast samples for ferritic grades of the ferritic to pearlitic group” in 7.4 (imported from EN 1563:2018);

— new Table 5 “Straightness of continuous cast bars” in 7.7;

— new 7.8 “Ultrasonic testing”;

— new Figure 1 and Table 6 “Dimensions of grey cast iron tensile test pieces”;

— new Figure 2 “Dimensions of spheroidal graphite cast iron tensile test pieces”;

— modification of Table A.1 “Guidance values for Brinell hardness”;

— modification of Table B.2 “Machining allowances for continuous cast iron bars”;

— modification of Table D.2 “Examples of mechanical properties measured on continuous cast iron bars with a diameter of 160 mm”.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of

North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom

Introduction

EN 1561 and EN 1563 classify grey cast irons and spheroidal graphite cast irons respectively, which are cast in sand moulds or moulds of comparable thermal behaviour.

This document classifies grey cast iron and spheroidal graphite cast iron bars, which are produced by the continuous casting process.

Due to the high cooling rate during solidification and further cooling, both graphite and matrix structure differ from those obtained by sand casting and consequently the mechanical properties in relation to section thickness [8], [9].

The mechanical properties of continuous cast iron bars are evaluated on machined test pieces prepared from samples cut from the bars.

However, for many applications, tensile strength or hardness are not the only interesting or determining properties. Other mechanical or physical properties can be decisive for the use of grey cast iron or spheroidal graphite cast iron, for example: thermal capacity, thermal diffusivity, damping capacity, thermo-cycle fatigue and toughness.

Additional technical data for grey cast irons is given in EN 1561 and for spheroidal graphite cast irons in EN 1563 and Annex D of this document.

1 Scope

This document specifies the grades of grey cast iron and spheroidal graphite cast iron bars, which have been produced by the continuous casting process.

This document specifies the characterizing properties of grey cast iron bars by either:

a) the tensile strength measured on machined test pieces prepared from samples cut from the bars, or

b) the hardness measured on the bars.

If agreed by the manufacturer and the purchaser, the combination of both tensile strength from option a) and hardness from option b) can be specified.

This document specifies the characterizing properties of spheroidal graphite cast iron bars by the tensile strength measured on machined test pieces prepared from samples cut from the bars.

This document specifies 4 grades of grey cast iron and 14 grades of spheroidal graphite cast iron by a classification based on tensile strength and 4 grades of grey cast iron by a classification based on Brinell hardness.

This document specifies also the straightness of the bars.

This document does not cover technical delivery conditions for iron castings (see EN 1559-1 and EN 1559-3).

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 10204, *Metallic products — Types of inspection documents*

EN ISO 945-1, *Microstructure of cast irons — Part 1: Graphite classification by visual analysis (ISO 945-1)*

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1
grey cast iron
cast material, mainly iron and carbon based, the carbon being present mainly in the form of flake (lamellar) graphite particles

Note 1 to entry: Grey cast iron is also known as flake graphite cast iron, and less commonly known as lamellar graphite cast iron.

[SOURCE: EN 1561:2023, 3.1, modified - Note 2 has been deleted.]

3.2
spheroidal graphite cast iron
cast material, iron, carbon and silicon based, the carbon being present mainly in the form of spheroidal graphite particles

Note 1 to entry: Spheroidal graphite cast iron is also known as ductile iron, and less commonly as nodular iron.

[SOURCE: EN 1563:2018, 3.1]

3.3
ferritic to pearlitic cast irons
grey cast iron and spheroidal graphite cast iron with a matrix containing ferrite or pearlite or a combination of both

3.4
solid-solution strengthened ferritic spheroidal graphite cast iron
spheroidal graphite cast iron with a matrix mainly consisting of ferrite, solution strengthened mainly by silicon

3.5
graphite spheroidizing treatment
operation that brings the liquid iron into contact with a substance to produce graphite in the predominantly spheroidal (nodular) form during solidification

Note 1 to entry: This operation is often followed by a second one called inoculation.

[SOURCE: EN 1563:2018, 3.4]

3.6
sample
quantity of material cut from the continuous cast bar to represent the cast material

4 Designation

The material shall be designated in accordance with Table 1, Table 2, or Table 3.

NOTE The designation system is specified in EN 1560.

5 Order information

The following information shall be stated in the order:

a) the number of this document;

b) the designation of the material;

c) the dimensions of the bar;

d) any special requirements.

All requirements shall be agreed by the time of acceptance of the order, e.g. technical delivery conditions according to EN 1559-1 and EN 1559-3.

6 Manufacture

The methods of producing grey cast iron and spheroidal graphite cast iron continuous cast bars and their chemical compositions shall be left to the discretion of the manufacturer who shall ensure that the requirements of this document are met for the material grade specified in the order.

For the cast irons to be used in special applications, the chemical composition and the heat treatment may be the subject of an agreement between the manufacturer and the purchaser.

All agreements between the manufacturer and the purchaser shall be made by the time of the acceptance of the order.

7 Requirements

7.1 Characterizing properties

The order shall specify in an unambiguous manner whether the tensile strength measured on a test piece machined from samples cut from the continuous cast bars or the Brinell hardness measured on the bars is the characterizing property. If it does not do so, then the manufacturer shall characterize the material according to tensile strength.

7.2 Tensile properties

7.2.1 General

The property values apply to grey cast iron and spheroidal graphite cast iron bars produced by the continuous casting process.

Tensile properties are dependant of the bar diameter as shown in Table 1 and Table 2.

For rectangular bars, the corresponding diameter D for the determination of the minimum tensile properties shall be calculated with Formula (1):

$$D = \frac{2 \times \left(H \times B \right)}{\left(H + B \right)} \tag{1}$$

where

D is the corresponding bar diameter, in millimetres (mm);

H is the height of the bar, in millimetres (mm);

B is the width of the bar, in millimetres (mm).