

# **SLOVENSKI STANDARD**

## **SIST EN 1559-3:2011**

**01-december-2011**

**Nadomešča:**

**SIST EN 1559-3:1998**

---

**Livarstvo - Tehnični dobavni pogoji - 3. del: Dodatne zahteve za litoželezne ulitke**

Founding - Technical conditions of delivery - Part 3: Additional requirements for iron castings

Gießereiwesen - Technische Lieferbedingungen - Teil 3: Zusätzliche Anforderungen an Eisengussstücke

Fonderie - Conditions techniques de fourniture - Partie 3: Spécifications complémentaires pour les pièces moulées en fonte

<https://standards.iteh.ai/catalog/standards/sist/c606f228-d46f-4073-b48e-99bd90ab61d2/sist-en-1559-3-2011>

**Ta slovenski standard je istoveten z: EN 1559-3:2011**

---

**ICS:**

77.140.80      Železni in jekleni ulitki      Iron and steel castings

**SIST EN 1559-3:2011**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 1559-3:2011

<https://standards.iteh.ai/catalog/standards/sist/c606f228-d46f-4073-b48e-99bd90ab61d2/sist-en-1559-3-2011>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1559-3**

October 2011

ICS 77.140.80

Supersedes EN 1559-3:1997

English Version

**Founding - Technical conditions of delivery - Part 3: Additional  
requirements for iron castings**

Fonderie - Conditions techniques de fourniture - Partie 3:  
Spécifications complémentaires pour les pièces moulées  
en fonte

Gießereiwesen - Technische Lieferbedingungen - Teil 3:  
Zusätzliche Anforderungen an Eisengussstücke

This European Standard was approved by CEN on 17 September 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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 and United Kingdom.

SIST EN 1559-3:2011

<https://standards.iteh.ai/catalog/standards/sist/c606f228-d46f-4073-b48e-99bd90ab61d2/sist-en-1559-3-2011>



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

# Contents

Page

Foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 • Terms and definitions .....	5
4 Information to be supplied by the purchaser .....	6
4.1 • Mandatory information.....	6
4.2 Optional information.....	6
4.3 • Drawings, patterns and tools .....	6
4.4 • Information on the mass .....	6
4.5 • Preliminary sample.....	6
4.6 • Initial sample .....	6
5 Designations .....	6
6 Manufacture.....	6
6.1 • Manufacturing process .....	6
6.2 Welding operations.....	6
7 Requirements .....	7
7.1 • General .....	7
7.2 Material .....	7
7.3 Casting.....	7
8 Inspection .....	8
8.1 • General .....	8
8.2 • Type of inspection documents and type of inspection .....	8
8.3 Test unit.....	8
8.4 • Samples .....	9
8.5 • Test .....	9
8.6 • Invalidation of tests .....	9
8.7 • Retests .....	9
8.8 • Sorting and reprocessing .....	9
9 • Marking .....	9
10 • Packaging and surface protection.....	9
11 • Complaints .....	9
Annex A (informative) Guidelines for the specification of acceptance criteria for the outer and inner conditions (non-destructive testing) .....	10
Annex B (informative) Guidelines for the specification of acceptance criteria for surface condition (visual check).....	13
Annex C (informative) Significant technical changes between this European standard and the previous edition .....	15
Bibliography .....	16

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

[SIST EN 1559-3:2011](https://standards.iteh.ai/catalog/standards/sist/c0061228-d46f-4073-b48c-99b9a1a601d2/sist-en-1559-3-2011)

[https://standards.iteh.ai/catalog/standards/sist/c0061228-d46f-4073-b48c-](https://standards.iteh.ai/catalog/standards/sist/c0061228-d46f-4073-b48c-99b9a1a601d2/sist-en-1559-3-2011)

[99b9a1a601d2/sist-en-1559-3-2011](https://standards.iteh.ai/catalog/standards/sist/c0061228-d46f-4073-b48c-99b9a1a601d2/sist-en-1559-3-2011)

## Foreword

This document (EN 1559-3:2011) 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 April 2012, and conflicting national standards shall be withdrawn at the latest by April 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 supersedes EN 1559-3:1997.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 1 "Technical conditions of delivery and cast iron designation" to revise the following standard:

EN 1559-3, *Founding — Technical conditions of delivery — Part 3: Additional requirements for iron castings*

Annex C provides details of significant technical changes between this European Standard and the previous edition.

This standard is one of a series of European Standards for technical delivery conditions for castings. The other standards in this series are: **(standards.iteh.ai)**

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

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

EN 1559-4, *Founding — Technical conditions of delivery — Part 4: Additional requirements for aluminium alloy castings*

EN 1559-5, *Founding — Technical conditions of delivery — Part 5: Additional requirements for magnesium alloy castings*

EN 1559-6, *Founding — Technical conditions of delivery — Part 6: Additional requirements for zinc alloy castings*

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 and the United Kingdom.

**EN 1559-3:2011 (E)****Introduction**

CEN/TC 190 "Foundry Technology" has prepared a series of material standards covering the following cast irons:

- grey cast irons [1];
- malleable cast irons [2];
- spheroidal graphite cast irons [3];
- ausferritic spheroidal graphite cast irons [4];
- abrasion resistant cast irons [5];
- austenitic cast irons [7];
- compacted (vermicular) graphite cast irons [8];
- low alloyed ferritic spheroidal graphite cast irons for elevated temperature applications [9].

In order to assist manufacturers and purchasers to prepare proper contractual arrangements and prevent misunderstanding, CEN/TC 190 approved the preparation of a series of standards covering technical delivery conditions. These have been prepared as separate parts.

This European Standard covers the additional technical delivery conditions for all the cast iron materials, e.g. optional information, manufacturing process, welding operation, additional requirements regarding the condition of the casting, test methods.

This European Standard cannot be used alone for compiling a specification for ordering and supplying iron castings, but as a complement to EN 1559-1.

The symbol ● against the clause reference indicates that the requirements of that clause of EN 1559-1 have to be met.

## 1 Scope

This European Standard specifies the additional technical delivery conditions for castings made from all cast iron materials.

This European Standard applies to iron castings produced in sand or permanent moulds or by centrifugal casting, continuous casting or investment casting.

## 2 Normative references

The following referenced documents are indispensable for the application 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 287-6, *Qualification test of welders — Fusion Welding — Part 6: Cast iron*

EN 444, *Non-destructive testing — General principles for radiographic examination of metallic materials by X- and gamma-rays*

EN 571-1, *Non destructive testing — Penetrant testing — Part 1: General principles*

EN 583-1, *Non-destructive testing — Ultrasonic examination — Part 1: General principles*

EN 1011-8, *Welding — Recommendations for welding of metallic materials — Part 8: Welding of cast irons*

prEN 1369, *Founding — Magnetic particle testing*

EN 1370, *Founding — Examination of surface condition*

EN 1371-1, *Founding — Liquid penetrant testing — Part 1: Sand, gravity die and low pressure die castings*

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

EN 1560, *Founding — Designation system for cast iron — Material symbols and material numbers*

EN 12680-3, *Founding — Ultrasonic testing — Part 3: Spheroidal graphite cast iron castings*

EN 12681, *Founding — Radiographic examination*

EN 14784-1, *Non-destructive testing — Industrial computed radiography with storage phosphor imaging plates — Part 1: Classification of systems*

EN 14784-2, *Non-destructive testing — Industrial computed radiography with storage phosphor imaging plates — Part 2: General principles for testing of metallic materials using X-rays and gamma rays*

EN ISO 9934-1, *Non-destructive testing — Magnetic particle testing — Part 1: General principles (ISO 9934-1:2001)*

EN ISO 15614-3, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 3: Fusion welding of non-alloyed and low-alloyed cast irons (ISO 15614-3:2008)*

## 3 • Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1559-1 and of the applicable material standard apply.

**EN 1559-3:2011 (E)****4 Information to be supplied by the purchaser****4.1 • Mandatory information**

The relevant wall thickness shall be given in the order.

**4.2 Optional information**

Where applicable, the enquiry and order shall include other details, such as requirements for

- a) an as-cast condition;

NOTE Heat treatment of malleable cast irons or ausferritic spheroidal graphite cast irons is a function of the material and is at the discretion of the manufacturer to achieve the desired mechanical properties.

- b) special or subsequent heat treatment if required (together with the heat-treatment conditions);
- c) heat treatment for stress relieving; it shall be agreed upon between the manufacturer and the purchaser;
- d) intentions to enamel, galvanize, plate, etc. the castings;
- e) sequence of machining and final heat treatment in the fabrication process (for ausferritic spheroidal graphite iron castings);
- f) formation of test units (unless already defined by material specifications it shall be in accordance with 8.3.1).

**4.3 • Drawings, patterns and tools****4.4 • Information on the mass**

[SIST EN 1559-3:2011](https://standards.iteh.ai/catalog/standards/sist/c606f228-d46f-4073-b48e-99bd90ab61d2/sist-en-1559-3-2011)

**4.5 • Preliminary sample**

<https://standards.iteh.ai/catalog/standards/sist/c606f228-d46f-4073-b48e-99bd90ab61d2/sist-en-1559-3-2011>

**4.6 • Initial sample****5 Designations**

The designation(s) of cast iron material(s) shall be in accordance with EN 1560.

NOTE Designations of cast iron materials are given in the applicable material standards.

**6 Manufacture****6.1 • Manufacturing process****6.2 Welding operations****6.2.1 • General**

Welding shall be performed by a qualified welder, in accordance with EN 287-6. Welding procedures shall be in accordance with EN ISO 15614-3 and based on the recommendations given in EN 1011-8.

**6.2.2 • Production welding**

Production welding shall only be permitted according to a written agreement between the manufacturer and the purchaser.



Subject to an agreement between the manufacturer and the purchaser, the manufacturer may either undertake finishing welding generally and/or up to a certain limit without reference back to the purchaser or may be required to seek the purchaser's permission in specific cases.

NOTE EN 1562 includes a weldable grade: EN-GJMW-360-12 (5.4201).

## 7 Requirements

### 7.1 • General

### 7.2 Material

#### 7.2.1 • Chemical composition

#### 7.2.2 • Mechanical properties

#### 7.2.3 • Other properties

### 7.3 Casting

#### 7.3.1 • Chemical composition

NOTE If post inoculation in the metal stream or in the moulds is carried out, there might be a slight deviation in analysis (silicon namely) between the composition of the liquid metal in the pouring device and the composition of the casting.

#### 7.3.2 • Mechanical properties

#### 7.3.3 • Outer and inner conditions (non destructive testing)

7.3.3.1 The testing shall be performed according to the relevant European Standards as listed in Table 1. Other methods may be agreed between purchaser and manufacturer.

Table 1 — Non Destructive test methods

Test method	Symbol	General principles, references	Test conditions, references
Liquid penetrant	PT	EN 571-1	EN 1371-1
Magnetic particle	MT	EN ISO 9934-1	prEN 1369
Ultrasonic	UT	EN 583-1	EN 12680-3 <sup>a</sup>
Radiographic	RT	EN 444 EN 14784-1 EN 14784-2	EN 12681
<sup>a</sup> applicable to spheroidal graphite cast irons			

NOTE Because some non-destructive testing methods are more suitable than others for iron castings, they should be discussed under the technical and economical aspects before agreement between the manufacturer and the purchaser.