

Founding — Austempered ductile cast irons

The European Standard EN 1564:1997, with the incorporation of amendment A1:2006, has the status of a British Standard

ICS 77.140.80

National foreword

This British Standard is the English language version of EN 1564:1997, including amendment A1:2006.

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Summary of pages

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CEN

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 2.30, Spheroidal graphite and austempered ductile iron, to prepare the following standard:

EN 1564 *Founding — Austempered ductile cast irons*

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.

Foreword to amendment A1

This European Standard (EN 1564:1997/A1:2006) has been prepared by Technical Committee CEN/TC 190 "Foundry technology", the secretariat of which is held by DIN.

This Amendment to the European Standard EN 1564:1997 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.

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 a EU Directive.

For relationship with the EU Directive, see informative Annex ZA, which is an integral part of this European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

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Introduction

This European Standard deals with the classification of austempered ductile cast iron¹⁾ in accordance with the mechanical properties of the material.

The properties of austempered ductile cast iron depend on its structure.

The mechanical properties of the material may be evaluated on machined test pieces prepared from:

- separately cast samples;
- samples cast onto either the casting or the running system, hereafter referred to as cast-on samples;
- samples cut from a casting (only when an agreement is made between the manufacturer and the purchaser).

The grade of the material is defined from the mechanical properties measured on machined test pieces prepared from separately cast samples.

If hardness is a requirement of the purchaser as being important for the application, then annex A provides means for its determination.

A1 Austempered ductile cast iron can be used for pressure equipment, e.g. for compressor housings.

The suitable material grades for pressure applications and the conditions for their use are given in specific product or application standards.

For the design of pressure equipment, specific design rules apply. **A1**

1 Scope

This European Standard defines the grades and the corresponding properties of austempered ductile cast irons.

This European Standard specifies a classification based on mechanical properties measured on machined test pieces prepared from:

- separately cast samples;
- cast-on samples;
- samples cut from a casting.

This standard does not cover technical delivery conditions for austempered ductile cast iron castings, see EN 1559-1 and EN 1559-3.

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 any 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.

EN 10002-1 *Metallic materials — Tensile testing — Part 1: Method of test*

EN 10003-1 *Metallic materials — Brinell hardness test — Part 1: Test method*

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

A1 EN 10204, *Metallic products — Types of inspection documents* **A1**

NOTE. Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in a bibliography, see annex B.

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 austempered ductile cast iron

Cast material, iron and carbon based, the latter element being present mainly in the form of the spheroidal particles, which, compared with the spheroidal graphite iron grades (see EN 1563), combines higher strength and toughness properties as a result of heat treatment.

3.2 graphite spheroidizing treatment

Treatment which brings the liquid iron into contact with a substance to produce graphite in the spheroidal form during solidification.

3.3 austenite transformation treatment

Heat treatment which consists of the transformation of austenite usually in the temperature range between 250 °C and 400 °C to form a predominantly austenitic-ferritic matrix structure. This treatment is an integral part of the production process.

4 Designation

The material shall be designated either by symbol or by number as given in table 1.

5 Order information

The following information shall be supplied by the purchaser:

- a) the number of this European Standard (EN 1564);
- b) the designation of the material;
- c) any special requirements which have to be agreed by the time of acceptance of the order.

6 Manufacture

The method of manufacturing austempered ductile iron as well as its chemical composition and heat treatment, unless specified by the purchaser, shall be left to the discretion of the manufacturer (see also annex C).

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

¹⁾ Austempered ductile cast iron is sometimes called ADI.