

Metallivalu. Tempermalmid

Founding - Malleable cast irons

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English Version

Founding - Malleable cast irons

Fonderie - Fontes malléables

Gießereiwesen - Temperguss

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Foreword

This document (EN 1562:2012) 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of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.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 1562:1997.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 6 “Malleable cast iron” to revise EN 1562:1997.

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

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.

Introduction

This European Standard classifies malleable cast irons into two groups. The first group is concerned with decarburized irons referred to as whiteheart malleable cast iron. The second group is non-decarburized irons referred to as blackheart malleable cast iron. Both groups, except completely decarburized whiteheart malleable cast iron, contain free carbon as graphite, called temper carbon. Both groups have grades with structures that can range from ferrite to pearlite and/or other transformation products of austenite.

Materials are designated in terms of tensile strength and percentage elongation.

Weldability is an important property of malleable cast irons.

Malleable cast irons have good impact resistance and ductility at low temperatures.

In this standard, a new designation system by number, as established in EN 1560 [1], is given.

NOTE This designation system by number is based on the principles and the structure as set out in EN 10027-2 [2] and so corresponds with the European numbering system for steel and other materials.

Some malleable cast iron grades can be used for pressure equipment.

The permitted material grades of malleable cast iron 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.

Annex ZA gives information relating to the conformance of permitted malleable cast iron grades to the Pressure Equipment Directive 97/23/EC.

1 Scope

This European Standard defines grades and the corresponding requirements for malleable cast irons.

This European standard specifies five grades of whiteheart malleable cast iron and nine grades of blackheart malleable cast iron, based on mechanical properties measured on cast samples (which are test pieces).

This European Standard specifies Brinell hardness values determined only when these values are requested by the purchaser.

This European Standard does not cover technical delivery conditions for malleable cast iron castings. Reference should be made to EN 1559-1 [3] and EN 1559-3 [4].

This European Standard does not cover chemical composition, except phosphorous (see Clause 6).

Grade EN-GJMB-300-6 (5.4100) malleable cast iron shall not be used for any pressure application, e. g. also pressure applications not covered by the Pressure Equipment Directive 97/23/EC.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 764-5:2002, *Pressure equipment — Part 5: Compliance and inspection — Documentation of materials*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN ISO 148-1:2010, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2009)*

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

EN ISO 6892-1:2009, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2009)*

3 Terms and definitions

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

3.1

malleable cast iron

cast material, mainly iron and carbon based, which solidifies in the as-cast condition with a graphite-free (white) structure and achieves its final properties after a heat treatment

3.2

whiteheart malleable cast iron

cast material, mainly iron and carbon based, which is cast white and then given a heat treatment in a decarburizing atmosphere to produce a material which is partially or entirely decarburized. Any remaining graphite is in the form of temper carbon

3.3

blackheart malleable cast iron

cast material, mainly iron and carbon based, which is cast white and then given a non-decarburizing heat treatment, to produce a material in which all graphite is in the form of temper carbon