AS 1830—2007
ISO 185:2005
Reconfirmed 2017

Australian Standard®

Grey cast iron

This Australian Standard® was prepared by Committee MT-001, Iron and Steel. It was approved on behalf of the Council of Standards Australia on 8 December 2006.
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The following are represented on Committee MT-001:

- Australian Railway Association
- Australian Building Codes Board
- Australian Foundry Institute
- Australian Industry Group
- Australian Steel Industry
- Bureau of Steel Manufacturers of Australia
- Institute of Materials Engineering Research Association
- New Zealand Heavy Engineering Research Association

This Standard was issued in draft form for comment as DR 06614.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

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STANDARDS AUSTRALIA

RECONFIRMATION
OF
AS 1830—2007
Grey cast iron

RECONFIRMATION NOTICE

Technical Committee MT-001 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 04 June 2017.

The following are represented on Technical Committee MT-001:

Australian Building Codes Board
Australian Steel Association
Australian Steel Institute
Bureau of Steel Manufacturers of Australia
Employers and Manufacturers Association
Materials Australia
New Zealand Heavy Engineering Research Association
Society of Automotive Engineers- Australasia

NOTES

Australian Standard®

Grey cast iron

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT-001, Iron and Steel, to supersede AS 1830—2002, *Grey cast iron.*

After consultation with stakeholders in both countries, Standard Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

This Standard is identical with, and has been reproduced from ISO 185:2005, *Grey cast irons—Classification*.

The objective of this Standard is to specify grades of Grey cast irons by chemical composition and hardness.

This Standard is one of a series of Standards covering the range of tensile testing methods. The series comprises the following:

AS	
1830	Grey cast iron (this Standard)
1831	Ductile cast iron
1832	Malleable cast iron
1833	Austenitic cast iron
1982	Methods for the measurement of case depth in steels
2027	Abrasive-resistant cast irons
2074	Cast steels
4314	Founding—Patterns, pattern equipment and coreboxes for the production of sand moulds and sand cores
4738	Metal castings
4738.1	Part 1: Ferrous sand moulded
5049	Cast iron—Designation pf microstructure of graphite
5052	Compacted (vermicular) graphite cast irons—Classification
5054	Ausferritic spheroidal graphite cast irons—Classification
5080	Ferrous materials—Heat treatment—Glossary of terms

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this International Standard should read ‘this Australian Standard’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

(d) Where the ISO Standard number is shown (i.e. ISO 185) in a grey cast iron specification, it should be read as ‘AS 1830’.

References to International Standards should be replaced by references to Australian Standards as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS	
945	Cast iron—Designation of microstructure of graphite	5049	Cast iron—Designation of micro structure of graphite
6506	Metallic materials—Brinell hardness test	1816	Metallic materials—Brinell hardness test
6506-1	Part 1: Test method	1816.1	Part 1: Test method (ISO 6506-1:1997, MOD)
6892	Metallic materials—Tensile testing at ambient temperature	1391	Metallic materials—Tensile testing at ambient temperature
TR 15931	Designations systems for cast irons and pig irons	4738 4738.1	Metal castings Part 1: Ferrous sand moulded

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance

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INTRODUCTION

This International Standard deals with the classification of grey cast irons, subdivided into two groups, specified by their tensile strength and hardness, respectively.

The properties of grey cast irons depend on the form and distribution of the graphite and the structure of the matrix.

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, for example:

— the thermal capacity and the thermal diffusivity for disc brakes as well as radiators;

— the damping capacity for engine blocks or machine beds;

— the thermocycle fatigue for exhaust manifolds or ingot moulds.

Therefore, Annex A provides additional information of interest to casting designers.

In addition:

— Annex B contains “Additional information on the relationship between hardness and tensile strength”;

— Annex C contains “Additional information on the relationship between tensile strength, hardness and wall thickness of grey iron castings”.

NOTE This International Standard does not cover technical delivery conditions for grey iron castings.

NOTES

AUSTRALIAN STANDARD

Grey cast iron

1 Scope

This International Standard specifies the properties of unalloyed and low-alloyed grey cast irons used for castings, which have been manufactured in sand moulds or in moulds with comparable thermal behaviour.

This International Standard specifies the characterizing properties of grey cast iron by either

a) the tensile strength of separately cast samples, or if agreed by the manufacturer and the purchaser, of cast-on samples or samples cut from a casting (see Table 1), or

b) if agreed between the manufacturer and the purchaser, the hardness of the material measured on castings (see Table 2) or on a cast-on knob.

If agreed by the manufacturer and the purchaser, the combination of both tensile strength from option a) and hardness from option b) may be specified. When specifying a combination of tensile strength and hardness, it is recommended to consult the information in Annex B.

This International Standard does not apply to grey cast irons used for pipes and pipe fittings and continuous cast products.

This International Standard specifies eight grades of grey cast iron according to the tensile strength (see Table 1) and six grades of grey cast iron according to the Brinell hardness (see Table 2).

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.

ISO 945, *Cast iron — Designation of microstructure of graphite*

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

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO/TR 15931, *Designation system for cast irons and pig irons*

3 Terms and definitions

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

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

NOTE 1 Grey cast iron is also known as flake graphite cast iron, and less commonly as lamellar graphite cast iron.

NOTE 2 Graphite form, distribution and size are specified in ISO 945.