AS 1831—2007
ISO 1083:2004
Reconfirmed 2017

AS 1831—2007

Australian Standard®

Ductile 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.
This Standard was published on 29 January 2007.

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 06612.

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 1831—2007
Ductile 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®

Ductile cast iron

Originated as AS 1439—1961.
Previous edition AS 1831—2002.
Fourth edition 2007.

Published by Standards Australia, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 7989 1

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT-001, Iron and Steel, to supersede AS 1831—2002, *Ductile 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 1083:2004, *Spheroidal graphite cast irons—Classification*.

The objective of this Standard is to specify grades of spheroidal graphite cast iron by mechanical properties.

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

1831 Ductile cast iron (this Standard)

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 of 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 appears on the cover and title page while the international standard number appears only on the cover.

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

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) Where the ISO Standard number is shown (i.e. ISO 1083) in a ductile cast iron specification, it should be read as 'AS 1831'.

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

Reference to International Standard ISO		*Australian Standard* AS	
148	Steel—Charpy impact test (V-notch)	1544	Methods for impact tests on metals
148-1	Part 1: Test method	1544.2	Method 2: Charpy V-notch test
148-2	Part 2: Verification of test macines		
148-3	Part 3: Preparation and characterization of Charpy V reference test pieces for verification of test machines		
945	Cast iron—Designation of microstructure of graphite	5049	Cast iron—Designation of microstructure 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	1394	Metallic materials—Tensile testing at ambient temperature
TR 15931	Designation systems for cast irons and pig irons	4738	Metal castings
		4738.1	Part 1: Ferrous sand moulded

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

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INTRODUCTION

The properties of spheroidal graphite cast irons depend on their structure.

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

— separately cast samples;

— samples cast on to either the casting or the running system, hereafter referred to as cast-on sample;

— samples cut from a casting (only when an agreement is made between the manufacturer and the purchaser).

The material grade is defined by mechanical properties measured on machined test pieces prepared from separately cast samples, cast-on samples or samples cut from the casting, by agreement between the manufacturer and the purchaser.

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

It is well known that tensile properties and hardness of spheroidal graphite cast iron are interrelated. When considered by the purchaser as being important for the application both tensile and hardness properties may be specified.

Some material grades may be suitable for pressure applications.

Further technical data on spheroidal graphite cast irons is given in Annexes C and G.

NOTES

AUSTRALIAN STANDARD

Ductile cast iron

1 Scope

This International Standard defines the grades and the corresponding requirements for spheroidal graphite cast irons.

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

— separately cast samples;

— cast-on samples;

— samples cut from a casting.

This International standard also specifies a classification as a function of hardness.

This International Standard does not apply to spheroidal graphite cast iron used for pipes, fittings and accessories which are specified in accordance with ISO 2531 and ISO 7186. It does not apply to highly alloyed (austenitic) spheroidal cast irons which are specified in accordance with ISO 2892. This International Standard does not apply to ausferritic cast irons which are specified in accordance with ISO 17804.

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 148, *Steel — Charpy impact test (V-notch)*

ISO 945:1975, *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
spheroidal graphite cast iron
cast material, iron and carbon-based, the carbon being present mainly in the form of spheroidal graphite particles

NOTE Spheroidal graphite cast iron is also known as ductile iron, and less commonly as nodular iron.