AS 5054—2007

Australian Standard®

Ausferritic spheroidal graphite cast irons—Classification

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 06611.

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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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-001, Iron and Steel.

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 17804:2005, *Ausferritic spheroidal graphite cast irons—Classification.*

The objective of this Standard is to specify five grades of Ausferritic spheroidal graphite cast irons which have been classified 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

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 Foundings—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 (this Standard)

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 17804) in an ausferritic spheroidal graphite cast iron specification, it should be read as 'AS 5054'.

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

Reference to International Standard		*Australian Standard*	
ISO		AS	
148	Metallic materials—Charpy pendulum impact test	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 machines		
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)
6507	Metallic materials—Vickers hardness test	1817	Metallic materials—Vickers hardness test
6507-1	Part 1: Test method	1817.1	Part 1: Test methods (ISO 6507-1:1997, MOD)
6892	Metallic materials—Tensile testing at ambient temperature	1391	Metallic materials—Tensile testing at ambient temperature
TR 15931	Designation system for cast irons and pig irons	4738	Metal castings
		4738.1	Part 1: Ferrous sand moulded

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a standard, where an ‘informative’ appendix is only for information and guidance.

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INTRODUCTION

Ausferritic spheroidal graphite cast iron is a cast alloy, iron and carbon based, carbon being present mainly in the form of spheroidal graphite particles.

Compared with the spheroidal graphite cast-iron grades (see ISO 1083:2004), this material combines higher strength and toughness properties as a result of the austempering heat treatment.

This International Standard deals with the classification of ausferritic spheroidal graphite cast irons in accordance with the mechanical properties of the material.

The mechanical properties of these ausferritic spheroidal graphite cast irons depend on their structure, e.g. the form of the graphite and the structure of the matrix.

The required structure is developed by selecting the appropriate composition and subsequent processing.

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

— separately cast samples with an appropriate gating system, able to provide metallurgical conditions similar to those of the castings they represent;

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

— samples cut from a casting (only by agreement between the manufacturer and the purchaser, the agreement specifying, in particular, the conditions of sampling and the values to be obtained).

Two grades of ausferritic spheroidal graphite cast iron are specified in Annex A, in accordance with their hardness. These cast irons are used in applications (e.g. mining, earth moving and manufacturing industries) where high abrasion resistance is required.

Five grades of ausferritic spheroidal graphite cast iron are specified by the mechanical properties. When, for these grades, hardness is a requirement for the application, Annex D provides means for determining appropriate hardness ranges.

AUSTRALIAN STANDARD

Ausferritic spheroidal graphite cast irons—Classification

1 Scope

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

This International Standard specifies five grades of ausferritic spheroidal graphite cast iron by a classification based on mechanical properties measured on machined test pieces prepared from:

— separately cast samples or cast-on samples;

— samples cut from a casting.

This International Standard also specifies two grades by a classification as a function of hardness.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 148-2, *Metallic materials — Charpy pendulum impact test — Part 2: Verification of test machines*

ISO 148-3, *Metallic materials — Charpy pendulum impact test — Part 3: Preparation and characterization of Charpy V reference test pieces for verification of test machines*

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

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

ISO 6507-1, *Metallic materials — Vickers 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*