Australian Standard™

Cast steels

Standards Australia

This Australian Standard was prepared by Committee MT-001, Iron and Steel. It was approved on behalf of the Council of Standards Australia on 9 May 2003 and published on 19 June 2003.

The following are represented on Committee MT-001:

Australasian Railway Association
Australian Building Codes Board
Australian Foundry Institute
Australian Industry Group
Australian Institute of Steel Construction
Bureau of Steel Manufacturers of Australia
Institute of Materials Engineering Australasia

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 02080.

Australian Standard™

Cast steels

Originated as AS B27—1931 and AS E7—1938.
Previous edition AS 2074—1982.
Third edition 2003.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 5322 1

PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-001, Iron and Steel, to supersede AS 2074—1982.

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

The objective of this Standard is to specify the steel specifications, heat treatment and test requirements for cast steels.

AS 2074—1982 specified additional requirements, including fettling and dressing, freedom from defects, rectification of defects and certification. These additional requirements are now specified in AS 4738. This edition of the Standard is a material's standard.

Cognizance was taken of the following International (ISO) Standards available on the subject:

ISO	
4990:1986	Steel castings—General technical delivery requirements
4991:1994	Steel castings for pressure purposes
8062:1994	Castings—System of dimensional tolerances and machining allowances
11972:1998	Corrosion-resistant cast steels for general applications
11973:1999	Heat-resistant cast steels and alloys for general applications
13521:1999	Austenitic manganese steel castings

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

CONTENTS

Page

SECTION 1 SCOPE AND GENERAL
1.1 SCOPE AND APPLICATION 5
1.2 REFERENCED DOCUMENTS 5
1.3 DEFINITIONS 6
1.4 DESIGNATION OF GRADE 7
1.5 CHEMICAL COMPOSITION 8
1.6 HEAT TREATMENT 9
1.7 MASS EFFECT 9
1.8 MECHANICAL PROPERTIES 10
1.9 PROVISION AND PREPARATION OF TEST BARS 10
1.10 PREPARATION OF TEST PIECES 10
1.11 TEST REQUIREMENTS 11
1.12 RETESTS 12
1.13 ROUNDING OF TEST RESULT VALUES 13

SECTION 2 REQUIREMENTS FOR CARBON STEEL CASTINGS
2.1 CARBON STEEL CASTINGS FOR CASE HARDENING —GRADE C1 14
2.2 CARBON STEEL CASTINGS WITH HIGH MAGNETIC PERMEABILITY—GRADE C2 15
2.3 CARBON STEEL CASTINGS FOR GENERAL PURPOSES—GRADES AS 2074/C3, AS 2074/C4 AND AS 2074/C5 16
2.4 CARBON STEEL CASTINGS FOR RESISTANCE TO WEAR AND SUITABLE FOR SURFACE HARDENING—GRADE AS 2074/C6 17
2.5 CARBON STEEL CASTINGS FOR PRESSURE PURPOSES—GRADE AS 2074/C7A 18

SECTION 3 REQUIREMENTS FOR LOW ALLOY STEEL CASTINGS
3.1 1.5% MANGANESE STEEL CASTINGS—GRADE AS 2074/L1A AND AS 2074/L1B 20
3.2 1% CHROMIUM STEEL FOR RESISTANCE TO ABRASION—GRADES AS 2074/L2A, AS 2074/L2B AND AS 2074/L2C 21
3.3 FERRITIC STEEL FOR USE AT LOW TEMPERATURE—GRADE AS 2074/L3A 22
3.4 3% NICKEL STEEL FOR CASE HARDENING—GRADE AS 2074/L4A 23
3.5 LOW ALLOY STEEL FOR USE AT ELEVATED TEMPERATURES—GRADES AS 2074/L5A, AS 2074/L5B, AS 2074/L5C, AS 2074/L5D, AS 2074/L5E, AS 2074/L5F, AS 2074/L5G AND AS 2074/L5H 24
3.6 ALLOY STEEL FOR HIGHER TENSILE STRENGTH—GRADES AS 2074/L6, AS 2074/L6A, AS 2074/L6B AND AS 2074/L6C 28

SECTION 4 REQUIREMENTS FOR HIGH ALLOY STEEL CASTINGS
4.1 AUSTENITIC MANGANESE STEEL CASTINGS—GRADES AS 2074/H1A, AS 2074/H1B, AS 2074/H1C AND AS 2074/H1D 30
4.2 9% CHROMIUM-MOLYBDENUM STEEL CASTINGS—GRADE AS 2074/H2A 30
4.3 13% CHROMIUM STEEL CASTINGS FOR RESISTANCE TO CORROSION—GRADES AS 2074/H3A, AS 2074/H3B, AS 2074/H3C AND AS 2074/H3D 31
4.4 28% CHROMIUM STEEL CASTINGS—GRADE AS 2074/H4A 32

Page

4.5 AUSTENITIC CHROMIUM-NICKEL STEEL CASTINGS FOR RESISTANCE TO CORROSION—GRADES AS 2074/H5A, AS 2074/H5B AND AS 2074/H5C 33
4.6 AUSTENITIC CHROMIUM-NICKEL-MOLYBDENUM STEEL CASTINGS FOR RESISTANCE TO CORROSION—GRADES AS 2074/H6A, AS 2074/H6B, AS 2074/H6C, AS 2074/H6D AND AS 2074/H6E 34
4.7 PRECIPITATION HARDENING STEEL CASTINGS FOR RESISTANCE TO CORROSION—GRADES AS 2074/H7A AND AS 2074/H7B 36
4.8 ALLOY STEEL CASTINGS FOR USE AT HIGH TEMPERATURE—GRADES AS 2074/H8A, AS 2074/H8B, AS 2074/H8C, AS 2074/H8E, AS 2074/H8F, AS 2074/H8G, AS 2074/H8H, AS 2074/H8J AND AS 2074/H8K 37
4.9 AUSTENITIC CHROMIUM-NICKEL-MOLYBDENUM-COPPER STEEL CASTINGS FOR RESISTANCE TO CORROSION—GRADE AS 2074/H9A 39
4.10 DUPLEX (AUSTENITIC/FERRITIC) STAINLESS STEEL—GRADES, AS 2074/H10A, AS 2074/H10B, AS 2074/H10C AND AS 2074/H10D 40

APPENDICES
A PURCHASING GUIDELINES FOR OPTIONAL TEST REQUIREMENTS 42
B SUMMARY OF CHEMICAL COMPOSITION AND TENSILE PROPERTIES 45

STANDARDS AUSTRALIA

Australian Standard
Cast steels

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE AND APPLICATION

1.1.1 Scope

This Standard specifies requirements for carbon, low alloy and high alloy cast steels.

NOTES:

1 Advice and recommendations on information for optional test requirements to be supplied by the purchaser at the time of enquiry or order are contained in Appendix A.

2 A summary of chemical composition and tensile properties of steels included in this Standard is given in Appendix B, which also provides guidance on the selection of grades for specific applications.

3 AS 2074 only specifies materials. AS 4738 specifies the other additional requirements of the casting (See Preface).

1.1.2 Application

Castings shall comply with the general requirements of Section 1 and with the specific requirements of Sections 2, 3 and 4, as follows:

(a) Carbon steel.....Section 2.

(b) Low alloy steel .....Section 3.

(c) High alloy steel.....Section 4.

1.1.3 Other requirements

The castings shall comply with AS 4738.

NOTE: The purchaser should specify AS 2074 and AS 4738 on the purchase order.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1391	Methods for tensile testing of metals
1544 1544.2	Methods for impact tests on metals Part 2: Charpy V-notch
1816 1816.1	Metallic materials—Brinell hardness test Part 1: Test method (ISO 6506-1:1999, MOD)
1988	Welding of steel castings
2038	Methods for detecting the susceptibility of austenitic stainless steels to intergranular corrosion
2291	Methods for tensile testing of metals at elevated temperatures
2706	Numerical values—Rounding and interpretation of limiting values