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Australian Standard 2074–1977

STEEL CASTINGS
FOR GENERAL ENGINEERING PURPOSES

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENT ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Associated Chambers of Manufactures of Australia

Australian Foundry Institute

Bureau of Steel Manufacturers of Australia

Department of Defence

Department of Productivity

Electricity Supply Association of Australia

Institute of Steel Services Centre of Australia

Metal Trades Industry Association of Australia

Railways of Australia Committee

Society of Automotive Engineers—Australasia

This standard, prepared under the direction of Committee MT/1, Iron and Steel, by its subcommittee on steel castings, was approved by the Metals Standards Board on behalf of the Council of the Standards Association of Australia on 19 August 1977, and was published on 1 December 1977.

The specification is intended to include the technical provisions necessary for the supply of materials herein referred to, but does not purport to comprise all the necessary provisions of a contract.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 74165.

AUSTRALIAN STANDARD SPECIFICATION

STEEL CASTINGS
FOR GENERAL ENGINEERING PURPOSES

AS 2074–1977

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PREFACE

This standard was prepared under the direction of the Association's Committee on Iron and Steel by its subcommittee on steel castings, as the revision of AS G22—1969, which it accordingly supersedes. It sets out requirements for the manufacture and testing of steel castings for general engineering purposes, manufactured from plain carbon, low alloy and high alloy steels.

In this revision, some grades have been modified and/or added to provide for those steel castings currently used in industry, in particular, for railway applications. During the course of the revision, all railway systems in Australia were consulted regarding their requirements, with the view to covering those steel castings currently included in AS E7—1938, Carbon Steel Castings for Railway Rolling Stock, and as a result AS E7 will be withdrawn. The system of nomenclature in AS G22 has been retained to allow purchaser and manufacturer to identify with this standard an enquiry for a particular grade of casting.

Appendix A presents purchasing guidelines, including contractual requirements, previously included in the body of the standard, and directs attention to matters requiring consideration at the time of enquiry and/or order. The intention is to avoid misinterpretation or other problems and to ensure a clear understanding of product requirements by both purchaser and manufacturer. For the general principles and procedure which should be followed in welding steel castings, reference should be made to AS 1988, Code of Practice for Fusion Welding in the Production, Rectification and Repair of Steel Castings.

This standard requires reference to the following Australian standards:

AS 1391 Methods for Tensile Testing of Metals

AS 1544 Methods for Impact Tests on Metals
Part 1 — Izod
Part 2 — Charpy V-notch

AS 1816 Method for Brinell Hardness Test
Part 1 — Testing of Metals.

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Australian Standard Specification for STEEL CASTINGS FOR GENERAL ENGINEERING PURPOSES

FOREWORD

In the interests of standardization and economy, the purchaser of steel castings should endeavour to obtain his requirements within the framework of this standard. In this regard, Table 1 has been included as a summary for guidance in the selection of grades for specific applications.

However, if the purchaser is not satisfied that his requirements can be met within the framework of this standard, variations by contractual arrangement with the manufacturer may be established at the time of enquiry and/or order. Guidelines in this regard are given in Appendix A, which also lists information to be supplied by the purchaser at the time of enquiry and/or order.

TABLE 1

STEEL CASTINGS — SELECTION OF GRADES FOR SPECIFIC APPLICATIONS
(For guidance only)

Group	Casting application	Suitable grades, AS 2074/. . .		
		Plain carbon	Low alloy	High alloy
1	General engineering purposes, low carbon (mild steel) grades, TS = 430–540 MPa (N/mm²)	C3 C4–1 C4–2	—	—
2	General engineering purposes, medium tensile strength grades, TS = 540–700 MPa (N/mm²)	C5,C6	L1A,L1B	—
3	General engineering purposes, high tensile strength grades, TS = 700–1160 MPa (N/mm²)	—	L6,L6A–1,L6A–2, L6B–1,L6B–2, L6C	—
4	Electrical applications requiring high magnetic permeability	C2	—	—
5	Surface hardening	C6	—	—
6	Case hardening	C1	L4A	—
7	Wear resistance (including austenitic manganese steels)	C6	L2A,L2B	H1A,H1B,H4B
8	Low temperature service	—	L3A	H5A
9	Elevated temperature service	—	L5A,L5B,L5C, L5D,L5E,L5F	H2A,H8A,H8B, H8C,H8E–1, H8E–2,H8F, H8G,H8H,H8J
10	Corrosion resistance	—	—	H3A,H3B,H5A, H5B,H5C, H6A,H6B,H6C, H7A,H9A
11	Heat resistance	—	—	H4A,H8A,H8B, H8C,H8E–1, H8E–2,H8F, H8G,H8H,H8J

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 SCOPE. This specification sets out requirements for the manufacture and testing of plain carbon, low alloy and high alloy steel castings for general engineering purposes.

NOTE: Guidelines to purchasers on requirements that must be specified by the purchaser and those that must or may be agreed upon at the time of enquiry and/or order, are given in Appendix A.

1.2 APPLICATION. Castings shall comply with the general requirements of Section 1 and with the specific requirements of the following Sections, as applicable to the type of steel:

Plain carbon steel	—	Section 2
Low alloy steel	—	Section 3
High alloy steel	—	Section 4.

1.3 DESIGNATION OF GRADE. The steel castings shall be given an appropriate grade designation as shown in column 1 of Table 2.1 (plain carbon steel), Table 3.1 (low alloy steel) or Table 4.1 (high alloy steel), in accordance with the sequence below. The elements under (a), (b) and (c) shall always be present in the designation; the elements under (d), (e) and (f) are added as required.

(a) The number of this Australian Standard, followed by a solidus, i.e. AS 2074/.

(b) A letter denoting the level of alloys in the steel, viz:

C — plain carbon steel
L — low alloy steel
H — high alloy steel

(c) A number from 1 to 9 inclusive indicating castings of similar characteristics, as listed in column 1 of Table 2.1, 3.1 or 4.1.

(d) A letter to distinguish between steels of slightly different chemical composition, viz. A, B, C etc.

(e) A number, 1 or 2, preceded by a dash (or the word 'Type') to distinguish between steels of similar chemical composition but different mechanical properties.

(f) The letter 'M' to indicate a free-machining steel.

Examples of designation of grade:

Grade AS 2074/...	*Interpretation*	*Reference*
C1	The first of the plain carbon steels listed.	Table 2.1