Australian Standard®

ALUMINIUM AND ALUMINIUM ALLOYS—INGOTS AND CASTINGS

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Aluminium Development Council
Architectural Aluminium Fabricators Federation of Australia
Confederation of Australian Industry
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Metal Trades Industry Association of Australia
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ALUMINIUM AND ALUMINIUM ALLOYS— INGOTS AND CASTINGS

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PREFACE

This Standard was prepared by the Association's Committee on Aluminium and Aluminium Alloys to supersede AS 1874—1977.

During the preparation of this Standard, the Committee considered the following Standards issued by the International Organization for Standardization (ISO):

ISO/R115 *Classification and composition of unalloyed aluminium ingots for remelting.*

ISO/2378 *Aluminium alloy chill castings—Reference test bar.*

ISO/2379 *Aluminium alloy sand castings—Reference test bar.*

ISO/3522 *Cast aluminium alloys—Chemical composition and mechanical properties.*

The Standard is not compatible with ISO Standards, because Australian practice follows North American practice.

In this Standard, modifications to existing designations have been introduced and these are as follows:

Alloy designation—the second prefix letter now indicates structure pre-modification, rather than primary or secondary metal usage.

Temper designation—T2 temper has been deleted.

The relationship between alloys is illustrated in Appendix D.

In preparing this Standard, consideration was taken of the publication issued by The Aluminium Development Council of Australia (Limited), viz, *Aluminium standards and data, aluminium ingots and castings*.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

ALUMINIUM AND ALUMINIUM ALLOYS—INGOTS AND CASTINGS

1 SCOPE. This Standard specifies requirements for aluminium ingots and aluminium alloy ingots and castings.

NOTES:

1. Guidelines to purchasers on requirements that are to be specified by the purchaser and those that are to be agreed on at the time of enquiry and order are given in Appendix A.
2. Related composition specifications are given in Appendix D.

2 REFERENCED DOCUMENTS. The following Standards are referred to in this Standard.

AS	
1391	Methods for tensile testing of metals
2062	Methods for non-destructive penetrant testing of products and components
2612	Aluminium and aluminium alloys—Sampling and preparation of solid samples for optical emission spectrometry
2706	Numerical values—Rounding and interpretation of limiting values
B8	Methods for the colouring and marking of foundry patterns
BS	
1728	Methods for the analysis of aluminium and aluminium alloys
ASTM	
E34	Chemical analysis of aluminium and aluminium alloys
	Methods for emission spectrochemical analysis

3 DESIGNATION.

3.1 Material designation. The material designation of aluminium ingots and aluminium alloy ingots and castings, as given in Table 1, shall be in accordance with Appendix B.

3.2 Temper designation. The temper designation, as given in Table 2, shall be in accordance with Appendix C, and shall follow the material designation, the two being separated by a dash.

Examples of complete designation: AA 301-T6, CA 401-F1.

4 DEFINITIONS. For the purpose of this Standard, the following definitions apply.

4.1 Annealing—thermal treatment to soften metal by removal of strain hardening resulting from cold working, by recrystallization and by coalescing precipitates from the solid solution.

4.2 Artificial ageing—a thermal treatment of an alloy at above room temperature to produce strengthening by precipitation of soluble constituents from the supersaturated solid solution.

Also known as 'precipitation heat treatment'.

4.3 Ingot—a metal product prepared in a suitable form for remelting.

4.4 Natural ageing—strengthening of an alloy by spontaneous precipitation of soluble constituents from a super-saturated solid solution at room temperature.

4.5 Permanent mould casting—a metal product prepared by introducing molten metal by gravity or low pressure into a mould constructed of durable material, usually iron or steel, and allowing it to solidify.

4.6 Pressure die casting—a metal product produced by introducing molten metal by high pressure into a mould constructed of a durable metal, usually steel, and allowing it to solidify.

4.7 Sand casting—a metal product produced by pouring molten metal into a sand mould and allowing it to solidify.

4.8 Solution heat treatment—a process in which an alloy is heated to a suitable temperature and is held at this temperature long enough to allow soluble constituents to enter into solid solution where they are retained in a super-saturated state after quenching.

4.9 Stabilizing—a thermal treatment used to promote stability under service conditions in, for example, dimensions, mechanical properties, structure or internal stress.

4.10 Temper—designates a state after processing (for example, by mechanical and thermal treatments) required to produce characteristic physical and mechanical properties in a metal or an alloy.

5 FREEDOM FROM DEFECTS.

5.1 Ingots. Ingots shall be free from dross, slag and other harmful contamination.

5.2 Castings. Castings shall be clean and free from defects detrimental to their subsequent processing and end use.

Notwithstanding that castings have been passed as complying with this Standard, if faults in manufacture are revealed in subsequent processing of the castings, they may then be deemed not to comply.

6 RECLAMATION AND REPAIR OF CASTINGS. Rectification of defects in castings shall be permitted, provided that subsequent processing and usefulness of the castings are not impaired. Repair or reclamation of castings shall be permitted subject to the written approval of the purchaser and the purchaser's acceptance of the proposed repair methods (see Paragraph A6, Appendix A).

If castings have been subjected to non-destructive testing, they shall be re-examined in the area of the repair following any rectifying operation performed on the castings.