AS 2612—1997

Australian Standard®

Aluminium and aluminium alloys—Sampling for chemical and spectrochemical analysis

This Australian Standard was prepared by Committee CH/10, Analysis of Metals. It was approved on behalf of the Council of Standards Australia on 4 July 1997 and published on 5 September 1997.

The following interests are represented on Committee CH/10:

AMDEL

Australasian Institute of Mining and Metallurgy

Australasian Railway Association

Australian Aluminium Council

Australian Chamber of Commerce and Industry

Australian Chamber of Manufacturers

Bureau of Steel Manufacturers

Copper Technical Data Centre

Metal Trades Industry Association of Australia

National Association of Testing Authorities, Australia

The Royal Australian Chemical Institute

University of New South Wales

Additional interests participating in preparation of Standard:

Superintendent Companies and Aluminium Smelters

This Standard was issued in draft form for comment as DR 97005.

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Originated as AS 2612—1983.
Second edition 1997.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7337 1303 3

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH/10 on the Analysis of Metals to supersede AS 2612—1983.

This Standard is the result of a consensus among representatives of the Joint Committee to produce it as an Australian Standard.

The objective of this Standard is to update procedures in accordance with technological developments for the methods of sampling aluminium and aluminium alloys for chemical and spectrochemical analysis.

Sampling is the major source of variation in the determination of metals content of an alloy or the pure metal. Sampling personnel are required under this Standard to follow prescribed sampling procedures. These procedures may be varied provided that the analytical laboratory has demonstrated that the analyte concentrations determined in the product of the alternative sampling procedure are comparable with that of the bulk.

The Committee recognized that there is considerable variation in the types of moulds available and in current use for the provision of the ideal sample. Though vacuum moulds may provide an improved sample compared with book and centre-pour moulds, they are not widely used in Australia. They have not been included in the scope of this Standard. Book moulds have been omitted due to their lack of use.

Numbers of samples and sampling frequency are also considered outside of the scope of this Standard.

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S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE This Standard sets out methods for obtaining a representative sample of aluminium and aluminium alloys and procedures for the preparation of laboratory samples required for the determination of their chemical composition by both chemical and spectrochemical analysis. The procedures are suitable for use in manufacturing control, material and product acceptance, and research and development.

1.2 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.2.1 Batch—products of uniform chemical and physical composition derived as one of the following:

(a) The product from any discrete production period in which casting conditions remained substantially constant.

(b) A single furnace charge.

1.2.2 Cast forms—item of aluminium or aluminium alloy which has not been subject to deformation. Examples include an ingot, a semi-finished product obtained by continuous casting and a shaped casting.

1.2.3 Chemical method of analysis—method for the determination of chemical composition in which the sample is subjected to chemical reaction.

1.2.4 Laboratory sample—part or all of the preliminary sample brought to a required condition for analysis.

1.2.5 Preliminary sample—the sample ladled from the molten metal or that taken from the ingot from which the laboratory sample is prepared which is representative of the batch.

1.2.6 Spectrochemical method of analysis—method for the determination of chemical composition in which the determination of composition is carried out without subjecting the sample to chemical reaction, e.g. an atomic emission spectrometric method or an X-ray fluorescence spectrometric method.

1.2.7 Test portion—that part of the laboratory sample which is actually analysed.

1.2.8 Wrought product—item of aluminium or aluminium alloy which has been subject to deformation by extrusion, rolling, drawing, forging or some other method. Examples include a bar, a billet, a plate, a strip, a tube and a wire.

1.3 APPARATUS

1.3.1 Centre-pour mould—of steel or cast iron construction. A typical centre-pour mould is shown in Figure 1.

1.3.2 Ladle—capable of holding a minimum of 250 g of molten metal.

1.3.3 Lathe—capable of machining a consistent, smooth, flat surface and preferably having an automatic cross feed.