Australian Standard™

Alumina

Part 8: Determination of bulk density

Standards Australia

This Australian Standard was prepared by Committee MN/9, Alumina and Materials used in Aluminium Production. It was approved on behalf of the Council of Standards Australia on 15 February 2000 and published on 8 June 2000.

The following interests are represented on Committee MN/9:

Australasian Institute of Mining and Metallurgy

Australian Aluminium Council

CSIRO Minerals

Minerals Council of Australia

The Royal Australian Chemical Institute

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This Standard was issued in draft form for comment as DR 99139.

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First published as AS 2879.8—2000.

Published by Standards Australia International Ltd
PO Box 1055, Strathfield, NSW 2135, Australia

ISBN 0 7337 3315 8

PREFACE

This Standard was prepared by the Standards Australia Committee MN/9, on Alumina and Materials used in Aluminium Production as Part 8 of the AS 2879 series of methods for testing alumina.

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STANDARDS AUSTRALIA

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1 SCOPE

This Standard sets out a method for the determination of unpacked and packed bulk density of smelter-grade aluminium oxide primarily used for the production of aluminium.

Methods using the fall of sample into a receptacle have been found to be sensitive to flow rate variations, which are caused by physical properties of the aluminium oxide.

This method minimizes rate variations.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

2243 Safety in laboratories (series)

2850 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

2879 Alumina

2879.1 Part 1: Determination of loss of mass at 300°C and 1000°C

3 PRINCIPLE

A test portion of sample is allowed to fall in a narrow stream from a container onto a small metal impact plate from which the stream spreads and falls into a receiving vessel of known volume. The mass of sample filling the vessel is determined and unpacked bulk density is calculated on a moisture free (300°C) basis. The material in the receiver is then compacted while further sample is added so that packed bulk density can be determined again on a moisture free basis.

4 SAFETY

For information on laboratory safety, reference should be made to the relevant parts of AS 2243.

5 APPARATUS

5.1 Sample delivery apparatus

As shown in Figure 1, constructed entirely of metal. The orifice plate moves a 5 mm orifice beneath the delivery vessel to begin or terminate sample flow into the delivery tube.

5.2 Receiver

A cylindrical container of volume 200 ±10 mL, having internal length-to-diameter ratio of approximately 6:1. The exact volume V shall be determined accurately by temperature corrected water mass.

NOTE: An error of 0.5 mL in the volume determination will cause an error of 3.0 kg/m^3 in the bulk density.