Australian Standard®

# Alumina

## Part 2: Determination of particles passing a 20 μm aperture sieve

This Australian Standard was prepared by Committee MN/9, Alumina and Materials used in Aluminium Production. It was published on 28 March 1991.

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The following interests are represented on Committee MN/9:

Aluminium Development Council

Australian Mining Industry Council

Royal Australian Chemical Institute

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# Part 2: Determination of particles passing a 20 μm aperture sieve

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# PREFACE

This Standard was prepared by the Standards Australia Committee on Alumina and Materials used in Aluminium Production, under the direction of the Minerals Standards Board, as one of a series of Standards for the testing of alumina.

# CONTENTS

STANDARDS AUSTRALIA

# Australian Standard

# Alumina

## Part 2: Determination of particles passing a 20 μm aperture sieve

**1 SCOPE** This Standard sets out a wet-sieving procedure for the determination of the percentage by mass of particles of smelter-grade alumina passing a 20 μm aperture sieve.

**2 REFERENCED DOCUMENTS** The following documents are referred to in this Standard:

AS
1006 Solid stem general purpose thermometers

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

2879 Alumina—Determination of loss of mass at 300°C and 1000°C

NIST
SRM 1003a Glass spheres 8-58 μm

**3 PRINCIPLE** A test sample of alumina is sieved on a 20 μm electroformed sieve, using acetone and manual brushing, and the retained material is determined gravimetrically. Compensation is made for water absorption by ignition of the test sample and the + 20 μm material at 300°C.

**4 APPARATUS**

**4.1 General** Ordinary laboratory equipment.

**4.2 Test sieve**—nominally 75 mm to 100 mm diameter frame with an electroformed 20 μm aperture medium. The aperture shape may be either square or round. The medium may be supported by a suitable grid to provide adequate strength. The materials of construction shall be such that no physical change or chemical corrosion shall occur as a result of contact with acetone or moisture, or heating to 110°C. The test sieve shall be calibrated in accordance with the procedure in Appendix A.

**4.3 Sieve brush**—unpainted.

NOTE: A Fitch No 6 brush has been found to be suitable.

**4.4 Ovens**—The following ovens are required:

(a) An oven controlled at 110 ± 5°C.

(b) An oven fitted with mechanical air circulation and capable of being controlled at 300 ± 5°C. The temperature of the oven shall be measured using a total immersion mercury thermometer complying with AS 1006.

NOTE: Ovens utilizing natural air convection are not likely to achieve the required temperature control.

**4.5 Desiccator**—containing an aluminium heat sink (see AS 2879) and tray of desiccant (activated alumina or phosphorus pentoxide). A metal tray of approximate dimensions 150 mm diameter, 30 mm depth and containing approximately 250 g of desiccant is suitable. The desiccator should be of such dimensions that the internal circulation of air is not restricted.

**4.6 Platinum crucibles**—of 25 mL capacity and approximate dimensions of 35 mm diameter and 40 mm depth. Two crucibles are required for each determination. The crucibles shall be conditioned by placing in an oven held at 300°C for 30 min, then cooled and stored in the heat sink in the desiccator.

**4.7 Wash bottle**—polyethylene, with a fine jet and filled with reagent grade acetone.

**5 SAMPLING AND SAMPLE PREPARATION** A 50 g test sample shall be prepared from the laboratory sample using a riffle or rotary divider, taking particular care to avoid loss of fine particles through dusting. The test sample should be mixed well immediately before use.

**6 PROCEDURE** The procedure shall be as follows:

(a) Weigh 2 ± 0.1 g of test sample to the nearest 0.0001 g, record the mass ($m_1$) and transfer to a clean 20 μm test sieve (4.2).