Australian Standard™

Alumina

Part 5: Determination of angle of flow

STANDARDS AUSTRALIA

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Australasian Institute of Minium and Metallurgy

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PREFACE

This Standard was prepared by the Standards Australia Committee MN-009, Alumina and Materials used in Aluminium Production, as an editorially updated edition of AS 2879.5—1994, *Alumina,* Part 5: *Determination of angle of flow*.

In preparing the original Standard, acknowledgment was given to the following report: SMITH, T.K. Determination of the angle of flow of smelter-grade alumina, *Alumina Quality Workshop*. Proceedings. Perth, 1990, 279-290.

The objective of this Standard is to provide laboratories within the alumina refining industry and users of alumina in the aluminium smeltering industry with a method to determine the angle of flow of alumina.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

CONTENTS

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1 SCOPE

This Standard specifies a method for the determination of the angle of flow of smelter-grade alumina. The method is suitable for determining the angle of flow in the range 30° to 50°.

2 REFERENCED DOCUMENT

The following document is referred to in this Standard:

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

3 DEFINITION

For the purpose of this Standard, the definition below applies.

3.1 Angle of flow

The angle accorded by the side of the cone of residual material with the bottom of the test apparatus after the material under test has ceased to flow. For the purpose of calculation, it is assumed that the cone has straight sides.

4 PRINCIPLE

Alumina is poured through a series of funnels into a flat-bottomed reservoir. The alumina is allowed to flow out of the reservoir through an orifice. The angle of flow is calculated from the mass of test material used to fill the reservoir and that remaining in the reservoir at the completion of the test.

NOTE: The derivation of the equations used to calculate the angle of flow is presented in Appendix A.

5 APPARATUS

5.1 Filling funnel

A funnel of 110 ±10 mm diameter, having an internal neck diameter of 10 ±2 mm.

5.2 Flow-regulating funnel

A smooth metal funnel of 65 ±5 mm diameter, having an internal neck diameter of 5.5 ±0.5 mm, and a length of 110 ±20 mm. The length of the funnel neck shall be 50 ±5 mm. The lower end of the stem shall be squared off.

5.3 Reservoir

Of internal diameter 72.5 ±0.1 mm, internal height 72.5 ±0.1 mm, with an orifice diameter 4 ±0.1 mm and wall and base thicknesses of 4.5 ±0.1 mm, and of 300 mL nominal capacity. The reservoir shall be made of aluminium with a smooth internal finish and a top that has been machined flat.

