Australian Standard™

Guide to the sampling of alumina

Part 1: Sampling procedures

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 29 January 1999 and published on 5 March 1999.

The following interests are represented on Committee MN/9:

Australasian Institute of Mining and Metallurgy

Australian Aluminium Council

Minerals Council of Australia

Royal Australian Chemical Institute

This Standard was issued in draft form for comment as DR 98168.

Australian Standard™

Guide to the sampling of alumina

Part 1: Sampling procedures

First published as AS 4538.1—1999.

Published by Standards Australia
(Standards Association of Australia)
1 The Crescent, Homebush, NSW 2140

ISBN 0 7337 2535 X

PREFACE

This Guide was prepared by the Standards Australia Committee MN/9, Alumina and Materials used in Aluminium Production.

This Guide is Part 1 of the AS 4538 series for the sampling of alumina.

The objective of this Standard is to provide those responsible for sampling alumina with a set of rules that will ensure that all alumina samples are consistently processed.

An investigation of sampling theory has been undertaken to justify the principles adopted.

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

CONTENTS

STANDARDS AUSTRALIA

Australian Standard

Guide to the sampling of alumina

Part 1: Sampling procedures

1 SCOPE This Guide sets out a procedure for the sampling of alumina from moving streams, including stopped-belt sampling, to provide samples for chemical analysis, physical testing and determination of moisture content.

The bulk of this procedure comprises generic sampling concepts that were extracted, in part, from AS 4433.1, and which are common to a diverse range of sampling regimes. Emphasis on alumina sampling is incorporated where appropriate, and a case study of the falling stream type mechanical autosampler in use at Alcoa of Australia's Kwinana ship-loading facility is cited, to highlight specific requirements for alumina sampling. Procedures for automated cross-belt sampling, sampling from stationary situations and manual sampling from moving streams are not discussed in this document, having been fully detailed in AS 4433.1.

Alumina's uniform particle size relative to other non-powder ores contributes to its homogeneous chemical properties, allowing simplified sampling theory to be employed. For a comprehensive description of sampling theory, and variographic techniques, refer to AS 4433.1. Physical segregation during handling and transportation may result in biased size distributions of incorrectly taken samples; the prevention or minimization of such segregation is the main focus of this procedure.

This Standard is not applicable to the sampling of alumina from fluidized streams, which presents particular sampling problems.

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

AS
1152 Specification for test sieves
4433 Guide to the sampling of particulate materials
4433.1 Part 1: Sampling procedures

3 DEFINITIONS For the purpose of this Guide, the definitions given below apply.

3.1 Bias—the tendency to obtain a value that is persistently higher or lower than the reference value; in practice, it is the difference between the reference value and the average result obtained from a large number of determinations.

3.2 Coefficient of variation (*cv*)—the ratio of the standard deviation to the mean value, expressed as a percentage.

3.3 Constant-mass division—the division of samples or increments so that the retained divided portions are of uniform mass, irrespective of variations in mass of the samples being divided.

NOTE: This method is required for sampling on a mass basis. 'Almost uniform mass' means that the variations in mass are less than 20% in terms of the coefficient of variation.

3.4 Cut—a single traverse of the sample cutter through the alumina stream.