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Aluminium oxide primarily used for the production of aluminium — Method for the determination of tapped and untapped density

Oxyde d'aluminium principalement utilisé pour la production d'aluminium — Méthode de détermination de la masse volumique tassée ou inexploitée

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Foreword

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The committee responsible for this document is ISO/TC 226, *Materials for the production of primary aluminium*.

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Introduction

This International Standard is based on the Australian Standard AS 2879.8.

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Aluminium oxide primarily used for the production of aluminium — Method for the determination of tapped and untapped density

1 Scope

This International Standard describes methods for the determination of tapped and untapped 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 International Standard minimizes flow rate variations.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 806, *Aluminium oxide primarily used for the production of aluminium — Determination of loss of mass at 300 °C and 1 000 °C*

AS 4538.2, *Guide to the sampling of alumina — Preparation of samples*

3 Principle

A test portion of the 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 test portion filling the vessel is determined and untapped bulk density is calculated on a moisture-free (300 °C) basis. The material in the receiver is then compacted by tapping the container while further sample is added so that tapped bulk density can be determined, again, on a moisture-free basis. The loss of mass at 300 °C is determined on a test portion of sample, this value is used in the calculation of tapped and untapped bulk density on a moisture-free basis.

4 Apparatus

4.1 Sample delivery apparatus, as shown in Figure 1, constructed entirely of an abrasion resistant material, e.g. stainless steel, brass or aluminium. The orifice plate slides a 5 mm orifice beneath the delivery vessel to begin or terminate sample flow into the delivery tube.

4.2 Receiver, a cylindrical container of volume (200 ± 10) ml, having internal length-to-diameter ratio of approximately 6:1 with the exact volume V determined accurately by temperature corrected water mass and constructed of a material that precludes permanent deformation or damage on moderate tapping of the container. Metal or plastic is preferred.

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.

4.3 Laboratory top-pan balance, capable of weighing 500 g to nearest 0,1 g.

4.4 Metal straight edge.

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