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Carbonaceous materials used in the production of aluminium — Determination of baking level expressed by equivalent temperature

Produits carbonés utilisés pour la production de l'aluminium — Détermination du niveau de cuisson par estimation de la température de cuisson équivalente

Reference number
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 226, *Materials for the production of primary aluminium*.

This second edition cancels and replaces the first edition (ISO 17499:2006), which has been technically revised.

The main changes are as follows:

— technical description errors have been corrected in 3.2, 5.1, 5.2 and 7.3;

— technical details relating to procedure have been clarified in Clause 4 and 8.1;

— the precision statement text has been corrected and reformulated (without changing the precision values) in Clause 10;

— the description of the graphite crucible with a drawing has been moved from the appendix into the body text as 7.3;

— some editorial corrections have been made.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The equivalent temperature is used to express the baking level of a single anode or cathode, or the overall baking level and distribution of a section of any type of baking furnace constructed for baking carbon anodes or cathodes for the production of aluminium.

The equivalent temperature is also useful for monitoring and comparing the baking level of laboratory test anodes or cathodes and other samples.

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Carbonaceous materials used in the production of aluminium — Determination of baking level expressed by equivalent temperature

1 Scope

This document specifies the determination of the equivalent temperature of one anode or cathode in a baking furnace and the calculation of the overall baking level in a section in a baking furnace.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20203, *Carbonaceous materials used in the production of aluminium — Calcined coke — Determination of crystallite size of calcined petroleum coke by X-ray diffraction*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
equivalent temperature
baking level of an anode or cathode measured by the heat treatment of a reference coke attached to or placed with the anode or cathode and quantified in equivalent degrees, °E, determined from the mean crystallite height, L_c, of the reference coke using a calibration curve

Note 1 to entry: The calibration curve is derived by subjecting a series of separate samples of the green reference coke to a 2 h heat treatment at different hold temperatures, in degrees Celsius, and measuring the mean crystallite height, L_c. The equivalent temperature, T_{eq}, is numerically equal to the temperatures, in degrees Celsius, plotted on the calibration curve.

3.2
reference green coke
raw unprocessed petroleum coke from a refinery coker unit

Note 1 to entry: For use as a reference coke, the green coke should be a single source, low sulfur, anode grade coke, preferably with a sulfur mass fraction of <2,0 % and dried at 110 °C prior to use.

4 Principle

The equivalent temperature of an anode or cathode is determined by placing a graphite container with a test portion of the reference green coke in a stub-hole or other suitable depression prior to loading the anode or cathode in the baking furnace.

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