International Standard

ISO 11713

Carbonaceous materials used in the production of aluminium — Cathode blocks and baked anodes — Determination of the specific electrical resistivity at ambient temperature

Produits carbonés utilisés pour la production de l'aluminium — Blocs cathodiques et anodes cuites — Détermination de la résistivité électrique spécifique à la température ambiante

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Foreword

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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 11713:2000), which has been technically revised.

The main changes are as follows:

— Introduction revised;

— Clause 5 has been reworded, requirements are clearly expressed;

— Subclause 7.2, 5th line 1 ± 0,002 A/cm^2 is changed in 10’000 A/m^2 ± 20 A/m^2;

— Clause 10 in Figure horizontal *F* changed into *F’*.

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Introduction

The specific electrical resistance of the anode affects the anode voltage drop and hence the energy consumption. The specific electrical resistivity of carbon anodes and cathodes ideally should be as low as possible with the restriction that the other properties will thereby not be influenced negatively. The measurement of the specific electrical resistance is not only utilized to characterize the anode and cathode performance in the reduction cell, but also as a method for detecting microcracks in the material. In particular, horizontal cracks (i.e. cracks perpendicular to the longitudinal axis of the sample) influence the specific electrical resistance.

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Carbonaceous materials used in the production of aluminium — Cathode blocks and baked anodes — Determination of the specific electrical resistivity at ambient temperature

1 Scope

This document specifies a method for the determination of the specific electrical resistivity of cathode blocks and baked anodes used in the production of aluminium, using samples at ambient temperature.

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 8007-1, *Carbonaceous materials used in the production of aluminium — Sampling plans and sampling from individual units — Part 1: Cathode blocks*

ISO 8007-2, *Carbonaceous materials used in the production of aluminium — Sampling plans and sampling from individual units — Part 2: Prebaked anodes*

3 Terms and definitions

No terms and definitions are listed in this document.

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/

4 Principle

A fixed, constant direct current is passed through a sample of given cross-section. The voltage drop between sensors is measured and the specific electrical resistivity is calculated.

5 Apparatus

5.1 General Apparatus

5.1.1 **Drilling machine** equipped with a diamond-tipped drill.

5.1.2 **Cutter** equipped with a diamond-coated disk.

5.1.3 **Slide calliper,** accurate to ±0,1 mm.

5.1.4 **Ammeter,** accurate to ±0,002 A.

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