
**Carbonaceous materials for the
production of aluminium — Cathode
block materials —**

**Part 2:
Determination of the expansion
due to sodium penetration without
application of pressure**

*Produits carbonés utilisés pour la production de l'aluminium — Blocs
cathodiques —*

*Partie 2: Détermination de l'expansion due à la pénétration du
sodium sans application de pression*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 document 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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

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

This second edition cancels and replaces the first edition (ISO 15379-2:2004), which has been technically revised.

ISO 15379 consists of the following parts, under the general title *Carbonaceous materials for the production of aluminium — Cathode block materials*:

- *Part 1: Determination of the expansion due to sodium penetration with application of pressure*
- *Part 2: Determination of the expansion due to sodium penetration without application of pressure*

Introduction

Expansion due to sodium penetration is an important property of carbon cathode blocks. As soon as alumina electrolysis starts, sodium penetrates into the carbon cathode blocks causing swelling of these blocks. This increase in volume creates mechanical stresses within the blocks and/or bulging of the bottom block plate. This can lead to cracks through which liquid aluminium and/or liquid electrolyte can flow, reaching the thermal insulation beneath the blocks and destroying these ceramic materials. In such a case, the electrolysis cell has to be relined, resulting in loss of aluminium production and high expenses. Therefore, cathode blocks produced with materials allowing only low sodium penetration and having the lowest possible expansion due to sodium penetration are preferred.

The study can be supplemented by measuring electrical resistivity (see ISO 11713) before and after the test.

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