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**Carbonaceous materials for the  
production of aluminium — Calcined  
coke for electrodes — Determination  
of the electrical resistivity of granules**

*Produits carbonés utilisés pour la production de l'aluminium — Coke  
calciné — Détermination de la résistivité électrique granulaire*

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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 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition, ISO 10143:2014, of which it constitutes a minor revision. The main changes compared to the previous edition are as follows:

- [Clause 5](#), Apparatus, has been updated;
- [Clause 10](#), Test report, has been updated.

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](http://www.iso.org/members.html).

# Carbonaceous materials for the production of aluminium — Calcined coke for electrodes — Determination of the electrical resistivity of granules

## 1 Scope

This document specifies a method for the determination of the electrical resistivity of granular carbon (calcined or graphitized) used in the manufacture of carbon electrodes for the production of aluminium.

The measurement of electrical resistivity assists in assessing the extent of coke calcination. The electrical resistivity of the coke aggregate will influence the electrical resistivity of the coke electrodes made from it.

In general, a more highly calcined coke will have a lower electrical resistivity if other factors, such as grain size, are similar.

## 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 6375, *Carbonaceous materials for the production of aluminium — Coke for electrodes — Sampling*

ISO 6997, *Carbonaceous materials for the production of aluminium — Calcined coke — Determination of apparent oil content — Heating method*

ISO 8723, *Carbonaceous materials for the production of aluminium — Calcined coke — Determination of oil content — Method by solvent extraction*

ISO 11412, *Carbonaceous materials for the production of aluminium — Calcined coke — Determination of water content*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Principle

A test portion of the granular carbon is placed in a cylindrical holder which has electrical contacts at the top and bottom. A fixed pressure is applied to the test portion to ensure good electrical contact and a fixed, constant direct current is applied. The voltage drop and the height of the column of granules are measured and the electrical resistivity is calculated.

## 5 Apparatus

Ordinary laboratory apparatus, plus the following:

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- 5.1 Sample holder and plunger**, with removable base for cleaning as shown in [Figure 1](#).
- 5.2 Length-measuring device**, capable of measuring the movement of the compression plunger to  $\pm 0,1$  mm.
- 5.3 Plastic reference cylinder**, with a height of  $22 \text{ mm} \pm 0,01 \text{ mm}$  and a diameter of 25 mm, used for calibrating the length-measuring device ([5.2](#)).
- 5.4 Test machine**, capable of applying a constant pressure of  $3 \text{ MPa} \pm 1 \%$  to the plunger ([5.1](#)), giving a velocity to the plunger of not more than 10 mm/s, and with a centering device for the sample holder ([5.1](#)).
- 5.5 Power supply**, capable of providing a constant direct current of  $1 \text{ A} \pm 0,002 \text{ A}$ .
- 5.6 Voltmeter**, capable of measuring to the nearest  $\pm 0,01 \text{ mV}$ .
- 5.7 Oven**, capable of being maintained at  $110 \text{ }^\circ\text{C}$  for 12 h.

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