INTERNATIONAL STANDARD

ISO 579

Third edition
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Coke — Determination of total moisture

Coke — Détermination de l´humidité totale

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 579 was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 5, *Methods of analysis*.

This third edition cancels and replaces the second edition (ISO 579:1981), which has been technically revised.

Coke — Determination of total moisture

1 Scope

This International Standard specifies a method for determining the total moisture of coke. It can be used for the determination of moisture of blast-furnace coke, foundry coke and other high-temperature carbonization products.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 9411-2, *Solid mineral fuels — Mechanical sampling from moving streams — Part 2: Coke.*

ISO 13909-6:—[1)], *Hard coal and coke — Mechanical sampling — Part 6: Coke — Preparation of test samples.*

3 Principle

A sample is heated in air at 120 °C to 200 °C and maintained at this temperature until constant in mass. The moisture percentage is calculated from the loss in mass of the sample. Coke is not liable to oxidation under the specified conditions.

4 Apparatus

4.1 Drying oven, capable of maintaining a substantially uniform temperature zone at 120 °C to 200 °C and in which the rate of atmospheric change is sufficiently rapid for the test.

4.2 Tray, approximately 0,1 m^2 in area and 25 mm deep, made of non-corrodible material such as stainless steel, tinned steel or aluminium.

4.3 Balance, capable of weighing to the nearest 1 g.

5 Sample

The sample for the determination of total moisture, taken in accordance with ISO 13909-6 and ISO 9411-2 shall be kept in a sealed, airtight container. The whole of the sample is crushed to a nominal top size of 16 mm using a jaw crusher. From the crushed material, the laboratory sample is obtained by dividing.

1) To be published.

It is essential that precautions be taken to prevent loss of moisture during these operations, by undue ventilation or loss of sample as dust.

Samples which are visibly wet, and those for which the moisture is expected to exceed 15 %, are partially dried before reduction and division. This air-drying procedure is described in ISO 13909-6. The air drying of visibly wet samples shall be carried out in the laboratory in which the determination of residual moisture is carried out.

6 Procedure

Weigh the clean, dry, empty tray (4.2) to the nearest 1 g. Add about 1 kg of the laboratory sample, spread the coke evenly and reweigh to the nearest 1 g. Place the charged tray in the oven (4.1) at a temperature of 120 °C to 200 °C. After the drying period is complete, remove the tray with the dried sample from the oven. Reweigh the tray immediately to avoid absorption of moisture during cooling.

If there is any doubt that drying is not complete, reheat at 120 °C to 200 °C for further periods of heating until any change in mass does not exceed 0,1 %.

For a particular oven, the times required to ensure constancy in mass shall be verified by experiments.

NOTE If appropriate, the drying can be done at a lower temperature, e.g. 105 °C to 110 °C as for hard coal.

7 Expression of results

7.1 Sample as analysed (see clause 6)

The total moisture, M_T, of the coke as analysed, expressed as a percentage by mass, is given by the equation:

$$M_T = \frac{(m_1 - m_2) - (m_3 - m_2)}{(m_1 - m_2)} \times 100$$

where

m_1 is the mass, in grams, of the tray plus laboratory sample;

m_2 is the mass, in grams, of the dry, empty tray;

m_3 is the mass, in grams, of the tray plus sample after heating.

Report the result, as the mean of duplicate determinations, to the nearest 0,1 %.

7.2 Visibly wet sample (see clause 5)

For visibly wet samples, the total moisture M_T, expressed as a percentage by mass, is given by the equation:

$$M_T = X + M\left(1 - \frac{X}{100}\right)$$

where

X is the air-drying loss, as a percentage by mass, of the original sample;

M is the residual moisture, as a percentage by mass, determined on the air-dried laboratory sample.

8 Precision

8.1 Repeatability limit

The results of duplicate determinations (carried out over a short period of time, but not simultaneously) in the same laboratory, by the same operator, with the same apparatus on two representative portions taken from the same analysis sample, shall not differ by more than the value shown in Table 1.

8.2 Reproducibility critical difference

The means of the results of duplicate determinations performed in each of two laboratories, on representative portions, taken from the same sample after dividing and crushing, shall not differ by more than the value shown in Table 1.

Tableau 1 — Precision of total moisture

Maximum acceptable differences between results	
Repeatability limit	**Reproducibility critical difference**
0,5 % absolute	0,7 % absolute

9 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) the identification of the sample;

c) the results of the determination;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard, or regarded as optional;

f) the date of the determination.

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