BS ISO 579:2013

BSI Standards Publication

Coke — Determination of total moisture

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National foreword

This British Standard is the UK implementation of ISO 579:2013. It supersedes BS 1016-102:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/16, Solid mineral fuels.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Coke — Determination of total moisture

Coke — Détermination de l'humidité totale

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Foreword

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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.

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

This fourth edition cancels and replaces the third edition (ISO 579:1999), which has been technically revised.

INTERNATIONAL STANDARD ISO 579:2013(E)

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 referenced documents are indispensable for the application 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 13909-6, *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 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.

It is essential that precautions be taken to prevent change of moisture during these operations, by undue ventilation, contact with wet surfaces, etc. 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 (air-dried) before reduction and division. This air-drying procedure is described in ISO 13909-6 and the resulting air-dry loss is calculated to the nearest 0,1 % (X). The air drying of visibly wet samples shall be carried out in the laboratory in which the determination of the moisture remaining after air-drying (M) is carried out.

6 Procedure

Weigh the clean, dry, empty tray (4.2) to the nearest 1 g (m_1). Add about 1 000 g ± 100 g of the laboratory sample, spread the coke evenly and reweigh to the nearest 1 g (m_2). 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. Immediately reweigh the tray plus dried sample to the nearest 1 g (m_3) 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 % mass fraction.

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 mass fraction in percent, is given by Equation (1):

$$M_T = \frac{m_2 - m_3}{m_2 - m_1} \times 100 \quad (1)$$

where

m_1 is the mass, in grams, of the empty tray;

m_2 is the mass, in grams, of the tray plus coke before heating;

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

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

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 Equation (2):

$$M_T = X + M\left(1 - \frac{X}{100}\right) \quad (2)$$

where

X is the air-drying loss, as mass fraction in percent, of the original sample;

M is the residual moisture, as mass fraction in percent, 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 limit

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.

Table 1 — Precision of total moisture

Maximum acceptable differences between results	
Repeatability limit	**Reproducibility limit**
0,5 % mass fraction absolute	0,7 % mass fraction absolute

9 Test report

The test report shall include the following information:

a) a reference to this International Standard including year of publication;

b) the identification of the sample;

c) the results of the determination.

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