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Coke — Determination of true relative density, apparent relative density and porosity

Coke — Détermination de la densité relative vraie, de la densité relative apparente et de la porosité

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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).

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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.

This document was prepared by Technical Committee ISO/TC *27*, *Coal and coke*, Subcommittee SC 3, *Coke*.

This third edition cancels and replaces the second edition (ISO 1014:1985), which has been technically revised. It also incorporates the Technical Corrigendum ISO 1014:1985/Cor 1:1994.

The main changes compared to the previous edition are as follows:

— the normative references (see Clause 2) have been updated;

— the mandatory Terms and definitions clause (Clause 3) has been added and subsequent clauses have been renumbered;

— general and technical revision.

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.

Coke — Determination of true relative density, apparent relative density and porosity

1 Scope

This document specifies methods for

a) determining the true relative density of coke, crushed to <212 µm, in relation to water;

NOTE "True relative density" varies according to the displacement liquid used.

b) determining the apparent relative density of coke, i.e. the ratio of the mass of a volume of dry coke to the mass of an equal volume of water;

c) calculating the porosity of the coke.

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 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

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

ISO 18283, *Hard Coal and Coke — Manual sampling*

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 https://www.electropedia.org/

4 True relative density

4.1 Principle

The mass of water displaced by a known mass of dry coke, ground to pass a sieve of nominal size of openings 212 µm, is determined using a pyknometer. Air is displaced by boiling during the determination. Air-free distilled water is specified. Thermostatic control of the temperature is essential since a difference of 1 °C can cause an error of about 0,012 in the result.

4.2 Apparatus

4.2.1 Pyknometer, 50 ml capacity, Figure 1.

4.2.2 Water bath, with stirrer, thermostatically controlled to maintain a desired temperature 0 °C to within ±1 °C.

4.2.3 Two wash bottles, each containing about 50 ml of air free distilled water. One wash bottle is kept hot (80 °C to 90 °C) and the other is left in the water bath (4.2.2).

4.2.4 Reflux air condenser: a glass tube about 1 m long, of the same external diameter as the neck of the pyknometer (4.2.1) with a short length of rubber tubing for attaching it to the latter.

4.2.5 Glycerol bath: a suitable vessel in which sufficient glycerol can be heated for the lower two-thirds of the pyknometer (4.2.1) to be immersed.

4.2.6 Balance, accurate to 0,1 mg.

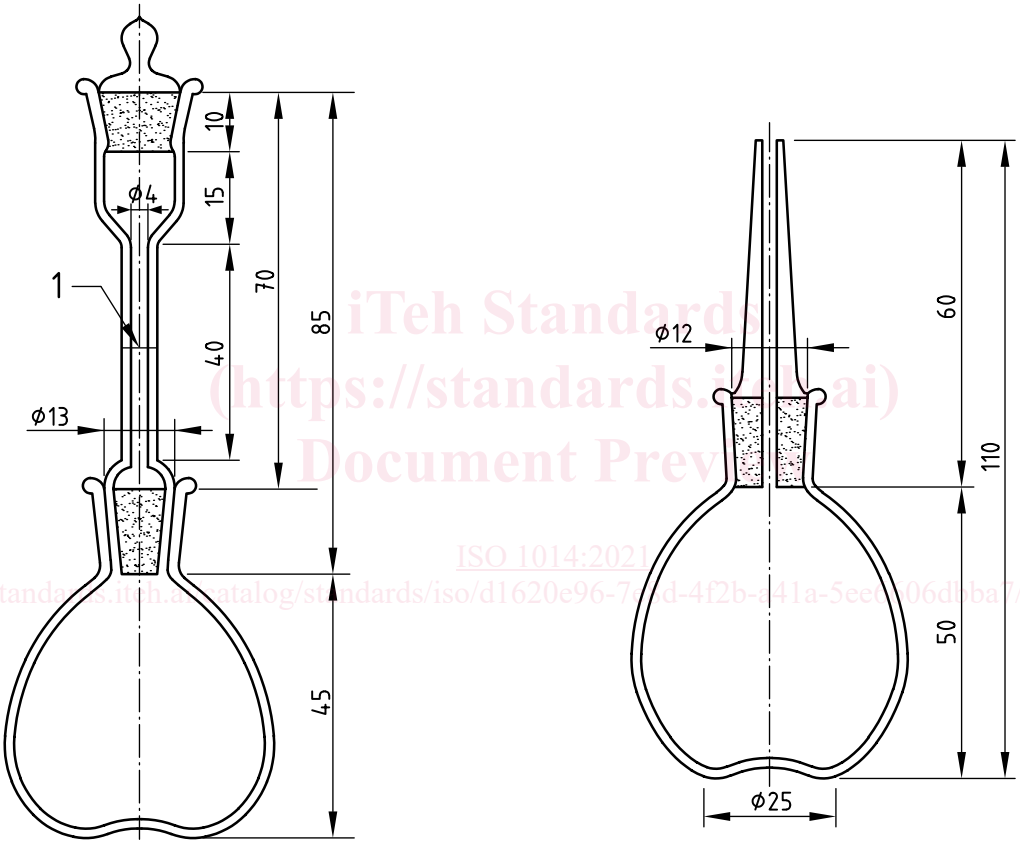

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Figure 1 — Example of pyknometer

4.3 Preparation of sample

The coke used for the determination is the analysis sample, ground to pass a sieve of nominal size of openings 212 µm (see ISO 13909-6, ISO 18283 and ISO 3310-2). Before commencing the determination, mix the sample thoroughly for at least 1 min, preferably by mechanical means.