
Coke — Determination of bulk density in a large container

*Coke — Détermination de la masse volumique en vrac dans un
récipient de grandes dimensions*

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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).

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).

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 03, *Coke*.

This third edition cancels and replaces the second edition (ISO 1013:1995), which has been technically revised.

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

- minor corrections only;
- Bibliography was added.

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.

Introduction

The coke bulk density depends on its physical characteristics, e.g. apparent relative density, shape and size of the coke particles, and on the dimensions of the container. The method described in this document is based on the use of any suitable large container, possibly that in which the coke is delivered, such as a wagon or skip. The determination of coke bulk density in a small container (of specified dimensions) is described in ISO 567.

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Coke — Determination of bulk density in a large container

1 Scope

This document specifies a method for the determination of the coke bulk density in a large container such as a wagon or skip.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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/>

3.1 coke bulk density

ρ_1
mass of a portion of a sample of coke divided by the volume of the container, which is filled by that portion under specified conditions.

4 Principle

A weighed container of known volume is filled with coke and the increase in mass is determined.

5 Apparatus

- 5.1 Container**, such as a wagon or skip, capable of holding at least 3 metric tonnes of the coke.
- 5.2 Machine**, machine, capable of weighing the container and its contents to an accuracy of 0,2 %.

6 Procedure

Weigh the empty container (5.1) on the weighing machine (5.2). Measure the internal dimensions of the container to the nearest 1 cm and calculate its capacity.

If the container is already fully charged, it should be weighed with the coke first, then be weighed empty and also be measured.

With the container on a level surface, carefully charge the coke into it until pieces of coke project above the top of the container across the whole surface.

Slide a straightedge across the top of the container and remove any pieces of coke, which obstruct its passage. Weigh the charged container.

7 Expression of results

The coke bulk density, ρ_1 , in a large container, in kilograms per cubic metre, on a dry basis, is given by the following [Formula \(1\)](#):

$$\rho_1 = \frac{m_2 - m_1}{V} \times \frac{100 - M}{100} \quad (1)$$

where

m_1 is the mass, in kilograms, of the empty container;

m_2 is the mass, in kilograms, of the container plus coke;

V is the volume, in cubic metres, of the container;

M is the total moisture mass fraction of the coke, expressed as a percentage, determined in accordance with ISO 579.

100 is expressed as a percentage (e.g. 100 %).

Report the result to three significant figures.

For calculation of the result on an "as sampled" basis, omit the correction factor for moisture, i.e. "(100 - M)/100", in [Formula \(1\)](#).

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8 Precision

8.1 Repeatability limit

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The results of two determinations, carried out at different times by the same operator with the same apparatus on samples from the same lot of coke, should not differ by more than 10 kg/m³.

8.2 Reproducibility

No value for reproducibility can be quoted for determinations carried out on different sites because the transportation of coke samples involves the risk of breakage and thus alteration of the size distribution and the bulk density.

9 Test report

The test report shall include the following information:

- a) the method used by reference to this document, i.e. ISO 1013:2020;
- b) a complete identification of the sample;
- c) the date of the test;
- d) the results expressed in accordance with [Clause 8](#).

Bibliography

- [1] ISO 567, *Coke — Determination of bulk density in a small container*
- [2] ISO 579, *Coke — Determination of total moisture*
- [3] ISO 18283, *Hard coal and coke — Manual sampling*

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