

Methods for

# Analysis and testing of coal and coke —

Part 108: Tests special to coke —

Section 108.4 Determination of bulk  
density (large container)

ICS 75.160.10

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee SFI/3, Analysis and testing of coal and coke, upon which the following bodies were represented:

British Cement Association  
 British Coal Corporation  
 British Gas plc  
 British Steel Industry  
 Electricity Association  
 GAMBICA (BEAMA Ltd.)  
 Power Generation Contractors Association (PGCA) (BEAMA Ltd.)

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# National foreword

This British Standard has been prepared by Technical Committee SFI/3 and is identical with ISO 1013:1995, *Coke — Determination of bulk density in a large container*, published by the International Organization for Standardization (ISO) and in the preparation of which the United Kingdom played a full part.

This British Standard is a revision of BS 1016-108.4:1991 which is withdrawn. Main changes in this edition are in the definition of bulk density and expression of results.

BS 1016-108.4 is part of a rationalized and restructured BS 1016. The Parts numbered from 1 to 21 are gradually being withdrawn and replaced by Parts in the new series. The full list of Parts in the new series, together with corresponding numbering of the old series and related ISO standards is given in BS 1016 *Methods for analysis and testing of coal and coke — Part 100:1994 General introduction and methods for reporting results*.

## Cross-references

International standard	Corresponding British Standard
	BS 1016 <i>Methods for analysis and testing of coal and coke</i>
ISO 567:1995	Part 108 <i>Tests special to coke</i> Section 108.3:1995 <i>Determination of bulk density</i> (Identical)
ISO 579:1981	Part 2:1973 <i>Total moisture of coke</i> (Technically equivalent)

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## Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

## Introduction

The bulk density of coke depends upon its physical characteristics, e.g. apparent relative density, shape and size of the coke particles, and upon the dimensions of the container. If the container is sufficiently large, its actual dimensions will have a negligible effect on the value obtained in a determination of bulk density. The method described in this International Standard 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 bulk density of coke in a small container (of specified dimensions) is described in ISO 567.

## 1 Scope

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

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 567:1995, *Coke — Determination of bulk density in a small container*.

ISO 579:1981, *Coke — Determination of total moisture content*.

## 3 Definition

For the purposes of this International Standard, the following definition applies.

### 3.1 bulk density

the mass of a portion of a solid mineral fuel 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 t of the coke.

**5.2 Weighing 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.

NOTE 1 If the container is already fully charged, it should be weighed with the coke first, then be weighed empty and then 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 bulk density in a large container ( $\rho_1$ ) of the coke, in kilograms per cubic metre, on a dry basis, is given by the equation:

$$\rho_1 = \frac{m_2 - m_1}{V} \times \frac{100 - M}{100}$$

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 capacity, in cubic metres, of the container;
- $M$  is the total moisture content of the coke, expressed as a percentage by mass, determined in accordance with ISO 579.

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 the equation.

## 8 Precision

### 8.1 Repeatability limit

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/m<sup>3</sup>.

### 8.2 Reproducibility

No value for reproducibility can be quoted for determinations carried out on different sites because the transport 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:

- a) the method used by reference to this International Standard;
- b) a complete identification of the sample;
- c) the date of the test;
- d) the results expressed in accordance with clause 7;
- e) any unusual features noted during the determination;
- f) any operation not included in this International Standard, or regarded as optional.

## List of references

See national foreword.

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