

Methods for

Analysis and testing of coal and coke —

**Part 100: General introduction and
methods for reporting results**

UDC 662.66 + 66.2.749.2:543

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Solid Mineral Fuels Standards Policy Committee (SFC/-) to Technical Committee SFC/3, upon which the following bodies were represented:

- British Cement Association
- British Coal Corporation
- British Gas plc
- British Steel Industry
- Electricity Industry in United Kingdom
- GAMBICA (BEAMA Ltd.)
- Power Generation Contractors' Association (BEAMA Ltd.)

This British Standard, having been prepared under the direction of the Solid Mineral Fuels Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 January 1994

© BSI 07-1999

The following BSI references relate to the work on this standard:
Committee reference SFC/3
Draft for comment 93/500617 DC

ISBN 0 580 22625 5

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 References	1
3 Definitions and symbols	1
4 Structure of BS 1016	3
5 Basis of reporting results	3
6 Interpretation of results	8
Annex A (informative) Derivations of the factors used for the calculation of hydrogen content to the dry, mineral-matter-free basis	12
Table 1 — Structure of BS 1016	2
Table 2 — Formulae for calculation of results to different bases	5
List of references	Inside back cover

Foreword

This Part of BS 1016 has been prepared under the direction of the Solid Mineral Fuels Standards Policy Committee. It provides an introduction to the new series of Parts of BS 1016 (from Part 101 onwards) and it is also a revision of BS 1016-16:1981, which is withdrawn. The section on reporting of results is technically equivalent to BS 1016-16:1981.

Under a scheme for rationalizing and restructuring BS 1016, the Parts numbered from 1 to 21 are gradually being withdrawn and replaced by Parts in the new series, as given in Table 1 (see clause 4). Those Parts in the earlier series which are still current are as follows, with the new Part numbers (which will be given to revisions when they are published) in parentheses.

- *Part 1: Total moisture of coal (Part 101);*
- *Part 2: Total moisture of coke (Part 102);*
- *Part 6: Ultimate analysis of coal (Part 106);*
- *Part 7: Ultimate analysis of coke (Part 106);*
- *Part 8: Chlorine in coal and coke (Part 106);*
- *Part 9: Phosphorus in coal and coke (Part 106);*
- *Part 10: Arsenic in coal and coke (Part 106);*
- *Part 11: Forms of sulphur in coal (Part 106);*
- *Part 14: Analysis of coal ash and coke ash (Part 114);*
- *Part 15: Fusibility of coal ash and coke ash (Part 113);*
- *Part 17: Size analysis of coal (Part 109);*
- *Part 18: Size analysis of coke (Part 110);*
- *Part 20: Determination of Hardgrove grindability index of hard coal (Part 112);*
- *Part 21: Determination of moisture-holding capacity of hard coal (Part 103).*

This Part of BS 1016 is related to ISO 1170:1977, published by the International Organization for Standardization (ISO).

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, 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.

1 Scope

This Part of BS 1016 gives a general introduction to BS 1016. It also provides formulae for the conversion of analytical data for coal and coke to the various different bases in common use, procedures for the interpretation of analytical results and other background information.

A list of the symbols used in this Part of BS 1016 is given in clause 3.

NOTE The symbol used for a particular quantity in this Part of BS 1016 is not necessarily the same as that used for the same quantity in another Part.

2 References

2.1 Normative references

This Part of BS 1016 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 1016 only when incorporated in it by updating or revision.

2.2 Informative references

This Part of BS 1016 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions and symbols

3.1 Definitions

For the purposes of this Part of BS 1016, the definitions given in BS 3323:1992 apply.

3.2 Symbols

The following symbols are used to denote the specified quantities.

Symbol	Quantity
A	ash, expressed as a percentage by mass
A_{sh}	shale ash, expressed as a percentage by mass
C	total carbon content, expressed as a percentage by mass
C_o	organic carbon content, expressed as a percentage by mass
$[Cl]$	chlorine content, expressed as a percentage by mass
$[Cl]_o$	organic chlorine content, expressed as a percentage by mass
$[CO_2]$	carbon dioxide (from carbonates) content, expressed as a percentage by mass

Symbol	Quantity
$[Fe]$	iron content, expressed as a percentage by mass
H	total hydrogen (excluding hydrogen from moisture) content, expressed as a percentage by mass
$\{H_2\}$	relative molecular mass of hydrogen
$\{H_2O\}$	relative molecular mass of water
M	moisture content, expressed as a percentage by mass
MM	mineral matter content, expressed as a percentage by mass
n	number of test results
N	nitrogen content, expressed as a percentage by mass
O	total oxygen (excluding oxygen from moisture) content, expressed as a percentage by mass
O_{min}	oxygen content of mineral matter
O_o	organic oxygen content, expressed as a percentage by mass
$Q_{\text{gr,p}}$	gross calorific value at constant pressure
$Q_{\text{gr,v}}$	gross calorific value at constant volume
$Q_{\text{net,p}}$	net calorific value at constant pressure
$Q_{\text{net,v}}$	net calorific value at constant volume
r	repeatability limit
s	repeatability standard deviation
s'	reproducibility standard deviation
S	total sulfur content, expressed as a percentage by mass
S_a	sulfur content of ash, expressed as a percentage by mass
S_o	organic sulfur content, expressed as a percentage by mass
S_p	pyritic sulfur content, expressed as a percentage by mass
S_s	sulfate sulfur content, expressed as a percentage by mass
$[SO_3]$	sulfur trioxide content of ash, expressed as a percentage by mass
t	value of Student's t at 95 % confidence level
V	volatile matter content, expressed as a percentage by mass
W	total moisture (including water of constitution combined with the mineral matter) content, expressed as a percentage by mass
Y	correction factor for the heat liberated by pyrites burning to iron (III) oxide during the determination of calorific value

Table 1 — Structure of BS 1016

Part/ Section/ Subsection	Title	Replaces Part	Related ISO standards
100	General introduction and methods for reporting results	16	1170
101 ^a	Determination of total moisture content of coal	1	589
102 ^a	Determination of total moisture content of coke	2	579
103 ^a	Determination of moisture-holding capacity of hard coal	21	1018
104	Proximate analysis of coal and coke	3,4	—
104.1	Determination of moisture content of the general analysis sample of coal	—	331
104.2	Determination of moisture content of the general analysis sample of coke	—	687
104.3	Determination of volatile matter content	—	562
104.4	Determination of ash	—	1171
105	Determination of gross calorific value	5	1928
106	Ultimate analysis of coal and coke	—	—
106.1	Determination of carbon and hydrogen content	6,7	—
106.1.1 ^a	High temperature combustion method	—	609
106.1.2 ^a	Liebig method	—	625
106.2 ^a	Determination of nitrogen content	6,7	333
106.3 ^a	Determination of oxygen content	—	1994
106.4	Determination of total sulfur content	6,7	—
106.4.1	Eschka method	—	334
106.4.2 ^a	High temperature combustion method	—	351
106.5 ^a	Determination of forms of sulfur	11	157
106.6	Determination of chlorine content	8	—
106.6.1 ^a	Eschka method	—	587
106.6.2 ^a	High temperature combustion method	—	352
106.7 ^a	Determination of carbon dioxide content of coal	6	925
106.8 ^a	Determination of phosphorus content	9	622
106.9 ^a	Determination of arsenic content	10	601
107	Caking and swelling properties of coal	12	—
107.1	Determination of crucible swelling number	—	501
107.2	Assessment of caking power by Gray-King coke test	—	502
107.3	Determination of swelling properties using a dilatometer	—	8264
108	Tests special to coke	13	—
108.1	Determination of shatter indices	—	616
108.2	Determination of Micum and Irsid indices	—	556
108.3	Determination of bulk density (small container)	—	567
108.4	Determination of bulk density (large container)	—	1013
108.5	Determination of density and porosity	—	1014
108.6	Determination of critical air blast value	—	—
109 ^a	Size analysis of coal	17	1953
110 ^a	Size analysis of coke	18	728, 2325
111	Determination of abrasion index of coal	19	—
112 ^a	Determination of Hardgrove grindability index of hard coal	20	5074
113 ^a	Determination of fusibility of coal ash and coke ash	15	540
114 ^a	Analysis of coal ash and coke ash	14	—

^a In preparation.