



**International
Standard**

ISO 1928

**Coal and coke — Determination of
gross calorific value**

*Charbon et coke — Détermination du pouvoir calorifique
supérieur*

**Fifth edition
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Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	2
3.1 Terms and definitions	2
3.2 Symbols	3
4 Principle	6
4.1 Gross calorific value	6
4.2 Net calorific value	7
5 Reagents	7
6 Apparatus	8
7 Preparation of test sample	12
8 Calorimetric procedure	13
8.1 General	13
8.2 Preparing the combustion vessel for measurement	15
8.2.1 General procedure	15
8.2.2 Using a combustion aid	15
8.3 Assembling the calorimeter	16
8.4 Combustion reaction and temperature measurements	16
8.5 Analysis of products of combustion	17
8.6 Corrected temperature rise	17
8.6.1 Observed temperature rise, $t_f - t_i$	17
8.6.2 Isoperibol and static-jacket calorimeters	17
8.6.3 Adiabatic calorimeters	18
8.6.4 Thermometer corrections	19
8.7 Reference temperature	19
9 Calibration	19
9.1 Principle	19
9.2 Calibrant	19
9.2.1 Certification conditions	19
9.2.2 Calibration conditions	19
9.3 Valid working range of the effective heat capacity	20
9.4 Ancillary contributions	20
9.5 Calibration procedure	21
9.6 Calculation of effective heat capacity for the individual test	21
9.6.1 Constant mass-of-calorimeter-water basis	21
9.6.2 Constant total-calorimeter-mass basis	21
9.7 Precision of the mean value of the effective heat capacity	22
9.7.1 Constant value of ε	22
9.7.2 ε as a function of the observed temperature rise	22
9.8 Redetermination of the effective heat capacity	23
10 Gross calorific value	23
10.1 General	23
10.2 Coal combustions	23
10.3 Coke combustions	24
10.4 Calculation of gross calorific value	24
10.4.1 General	24
10.4.2 Constant mass-of-calorimeter-water basis	25
10.4.3 Constant total-calorimeter-mass basis	26
10.4.4 ε as a function of the observed temperature rise	26
10.5 Expression of results	26

10.6	Calculation to other bases	27
11	Precision	27
11.1	Repeatability limit.....	27
11.2	Reproducibility limit.....	27
12	Calculation of net calorific value	27
12.1	General.....	27
12.2	Calculations.....	28
12.2.1	Calculation of net calorific value at constant pressure.....	28
12.2.2	Calculation of net calorific value at constant volume.....	29
13	Test report.....	30
Annex A (informative)	Adiabatic calorimeters	32
Annex B (informative)	Isoperibol and static-jacket calorimeters.....	36
Annex C (informative)	Automated calorimeters	41
Annex D (informative)	Checklists for the design of combustion tests and their procedures	44
Annex E (informative)	Examples to illustrate some of the calculations used in this document.....	49
Annex F (informative)	Safe use, maintenance and testing of calorimeter combustion vessels.....	55
Bibliography		61

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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 document 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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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 5, *Methods of analysis*.

This fifth edition cancels and replaces the fourth edition (ISO 1928:2020), which has been technically revised.

The main changes are as follows:

- title changed from solid mineral fuels to coal and coke;
- updated symbols within formulae;
- allowance for alternative material for calorimeter can;
- expanded on some derivations and added units of measure to some equations;
- removed ambiguity around crucible masses;
- specified the analysis sample;
- more concise wording around the use of a combustion aid and determining a correction value;
- warnings now included in body of text;
- the addition of alternate ignition methods.

Any feedback or questions on this document shall be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Coal and coke — Determination of gross calorific value

WARNING — Strict adherence to all of the provisions specified in this document is needed to ensure against explosive rupture of the combustion vessel, or a blow-out, provided that the combustion vessel is of proper design and construction and in good mechanical condition.

1 Scope

This document specifies a method for the determination of the gross calorific value of coal and coke at constant volume and at the reference temperature of 25 °C in a combustion vessel calorimeter calibrated by combustion of certified benzoic acid.

The result obtained is the gross calorific value of the analysis sample at constant volume with all the water of the combustion products as liquid water. In practice, fuel is burned at constant (atmospheric) pressure and the water is not condensed but is removed as vapour with the flue gases. Under these conditions, the operative heat of combustion is the net calorific value of the fuel at constant pressure. The net calorific value at constant volume can also be used; formulae are given for calculating both values.

General principles and procedures for the calibrations and the fuel tests are specified in the main text, whereas those pertaining to the use of a particular type of calorimetric instrument are described in [Annexes A](#) to [C](#). [Annex D](#) contains checklists for performing calibration and fuel tests using specified types of calorimeters. [Annex E](#) gives examples illustrating some of the calculations. [Annex F](#) provides guidance around safe use, maintenance and testing of the calorimeter combustion vessel.

NOTE Descriptors: solid fuels, coal, coke, tests, determination, calorific value, rules of calculation, calorimetry.

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 651:1975, *Solid-stem calorimeter thermometers*¹⁾

ISO 652:1975, *Enclosed-scale calorimeter thermometers*¹⁾

ISO 687, *Coke — Determination of moisture in the general analysis test sample*

ISO 1770:1981, *Solid-stem general purpose thermometers*¹⁾

ISO 1771:1981, *Enclosed-scale general purpose thermometers*¹⁾

ISO 5068-2, *Brown coals and lignites — Determination of moisture — Part 2: Indirect gravimetric method for moisture in the analysis sample*

ISO 11722, *Solid mineral fuels — Hard coal — Determination of moisture in the general analysis test sample by drying in nitrogen*

ISO 13909-4, *Hard coal and coke — Mechanical sampling — Part 4: Preparation of test samples of coal*

ISO 17247, *Coal and coke — Ultimate analysis*

ISO 18283, *Coal and coke — Manual sampling*

1) Withdrawn.