ISO 1928:2025-08 (E)

Coal and coke - Determination of gross calorific value

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, tf - ti 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 22
9.7.2 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 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