

DIN EN ISO 18125:2017-08 (E)

Solid biofuels - Determination of calorific value (ISO 18125:2017)

Contents

	Page
European foreword	4
Foreword	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Principle	7
4.1 Gross calorific value	7
4.2 Net calorific value	8
5 Reagents	8
6 Apparatus	9
7 Preparation of test sample	12
8 Calorimetric procedure	13
8.1 General	13
8.2 Preparing the bomb for measurement	15
8.2.1 General procedure	15
8.2.2 Using 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 θ	17
8.6.1 Observed temperature rise	17
8.6.2 Isoperibol and static-jacket calorimeters	17
8.6.3 Adiabatic calorimeters	19
8.6.4 Thermometer corrections	19
8.7 Reference temperature	19
9 Calibration	19
9.1 Principle	19
9.2 Calibrant	20
9.2.1 Certification conditions	20
9.2.2 Calibration conditions	20
9.3 Valid working range of the effective heat capacity ε	20
9.4 Ancillary contributions	21
9.5 Calibration procedure	21
9.6 Calculation of effective heat capacity for the individual experiment	22
9.6.1 Constant mass-of-calorimeter-water basis	22
9.6.2 Constant total-calorimeter-mass basis	22
9.7 Precision of the mean value of the effective heat capacity ε	23
9.7.1 Constant value of ε	23
9.7.2 ε as a function of the observed temperature rise	24
9.8 Redetermination of the effective heat capacity	24

10	Gross calorific value	24
10.1	General	24
10.2	Combustion	25
10.3	Calculation of gross calorific value	25
10.3.1	General	25
10.3.2	Constant mass-of-calorimeter-water basis	25
10.3.3	Constant total-calorimeter-mass basis	27
10.3.4	ε as a function of the observed temperature rise	28
10.4	Expression of results	28
10.5	Calculation to other bases	28
11	Performance characteristics	29
11.1	Repeatability limit	29
11.2	Reproducibility limit	29
12	Calculation of net calorific value at constant pressure	29
12.1	General	29
12.2	Calculations	29
13	Test report	30
Annex A (normative) Adiabatic bomb calorimeters		31
Annex B (normative) Isoperibol and static-jacket bomb calorimeters		35
Annex C (normative) Automated bomb calorimeters		41
Annex D (informative) Checklists for the design and procedures of combustion experiments		44
Annex E (informative) Examples to illustrate the main calculations used in this document when an automated bomb calorimeter is used for determinations		49
Annex F (informative) List of symbols used in this document		53
Annex G (informative) Default values of most used solid biofuels for the calculations of calorific values		56
Annex H (informative) Flow chart for a routine calorific value determination		57
Bibliography		58
Index		59