

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