

# DIN EN ISO 18125:2017-08 (E)

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

---

<b>Contents</b>		Page
<b>European foreword</b> .....		<b>4</b>
<b>Foreword</b> .....		<b>5</b>
<b>1 Scope</b> .....		<b>6</b>
<b>2 Normative references</b> .....		<b>6</b>
<b>3 Terms and definitions</b> .....		<b>6</b>
<b>4 Principle</b> .....		<b>7</b>
4.1 Gross calorific value .....		7
4.2 Net calorific value .....		8
<b>5 Reagents</b> .....		<b>8</b>
<b>6 Apparatus</b> .....		<b>9</b>
<b>7 Preparation of test sample</b> .....		<b>12</b>
<b>8 Calorimetric procedure</b> .....		<b>13</b>
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 $\theta$ .....		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
<b>9 Calibration</b> .....		<b>19</b>
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 $\epsilon$ .....		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 $\epsilon$ .....		23
9.7.1 Constant value of $\epsilon$ .....		23
9.7.2 $\epsilon$ as a function of the observed temperature rise .....		24
9.8 Redetermination of the effective heat capacity .....		24

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