



SLOVENSKI STANDARD

SIST EN 15148:2010

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SIST-TS CEN/TS 15148:2006

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Solid biofuels - Method for the determination of the content of volatile matter

Feste Biobrennstoffe - Bestimmung des Gehaltes an flüchtigen Substanzen

Biocombustibles solides - Méthode de détermination de la teneur en matières volatiles
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ICS:

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Solid fuels

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EUROPEAN STANDARD

EN 15148

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2009

ICS 75.160.10

Supersedes CEN/TS 15148:2005

English Version

Solid biofuels - Determination of the content of volatile matterBiocombustibles solides - Méthode de détermination de la
teneur en matières volatilesFeste Biobrennstoffe - Bestimmung des Gehaltes an
flüchtigen Substanzen

This European Standard was approved by CEN on 3 October 2009.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 15148:2009) has been prepared by Technical Committee CEN/TC 335 “Solid biofuels”, the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document supersedes CEN/TS 15148:2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The volatile matter content is determined as the loss in mass, less that due to moisture, when solid biofuel is heated out of contact with air under standardised conditions. The test is empirical and, in order to ensure reproducible results, it is essential that the rate of heating, the final temperature and the overall duration of the test are carefully controlled. It is also essential to exclude air from the solid biofuel during heating to prevent oxidation. The fit of the crucible lid is therefore critical. The moisture content of the general analysis sample is determined at the same time as the volatile matter so that the appropriate correction can be made.

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1 Scope

This European Standard aims to define the requirements and method used to determine the volatile matter content of solid biofuels. It is intended for persons and organisations that manufacture, plan, sell, erect or use machinery, equipment, tools and entire plants related to solid biofuels, and to all persons and organisations involved in producing, purchasing, selling and utilising solid biofuels.

The volatile matter content is determined as the loss in mass, less that due to moisture, when solid biofuel is heated out of contact with air under standardized conditions.

2 Normative references

The following referenced documents are indispensable for the application 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.

CEN/TS 14588:2003, *Solid biofuels – Terminology, definitions and descriptions*

CEN/TS 14780, *Solid biofuels — Methods for sample preparation*

EN 14774-3, *Solid biofuels — Determination of moisture content — Oven dry method — Part 3: Moisture in general analysis sample*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 14588:2003 shall apply.

4 Principle

A test portion of the general analysis sample is heated out of contact with ambient air at (900 ± 10) °C for 7 min. The percentage of volatile matter is calculated from the loss in mass of the test portion after deducting the loss in mass due to moisture.

Automatic equipment may be used when the method is validated with biomass reference samples of an adequate biomass type. This equipment shall fulfil all the requirements given in Clauses 5 to 8 regarding sample size, atmosphere, temperatures and weighing accuracy.

5 Apparatus

5.1 Furnace

The furnace shall be heated by electricity, in which a zone of uniform temperature of (900 ± 10) °C can be maintained. It may be of the stop-ended type or fitted at the back with a flue (see Figure 1, as example).

NOTE It is important for furnaces with flues that the furnace door seals well. The flue should not reach far out of the oven and should be fitted with a butterfly valve to restrict airflow through the furnace.

Its heat capacity shall be such that, with an initial temperature of (900 ± 10) °C, the temperature is regained within 4 min after insertion of a cold stand and its crucibles. The temperature is measured with a thermocouple, as described in 5.2.

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Normally the furnace will be designed specifically either for multiple determinations using a number of crucibles in one stand or for receiving one crucible and its stand.

The crucible stand shall be placed in the middle of the furnace. The temperature of 900 °C shall be attained as closely as possible with a specified tolerance of ± 10 °C in order to compensate for inherent errors in the temperature measurement and lack of uniformity in the temperature distribution.

5.2 Thermocouples

A sheathed thermocouple shall be permanently installed in the furnace (see Figure 1) with its thermojunction as close as possible to the centre of the heating chamber.

An unsheathed thermocouple long enough to reach the centre of the heating chamber. This thermocouple is used for calibration.

5.3 Crucible

The crucible shall be cylindrical, with a well-fitting lid, both of fused silica. The crucible with lid shall have a mass between 10 g and 14 g and dimensions approximating to those shown in Figure 2. The fit of the lid on the crucible is critical to the determination and a lid shall be selected to match the crucible so that the horizontal clearance between them is no greater than 0,5 mm. After selection, the crucible and the lid shall be ground together to give smooth surfaces and then be given a common distinguishing mark.

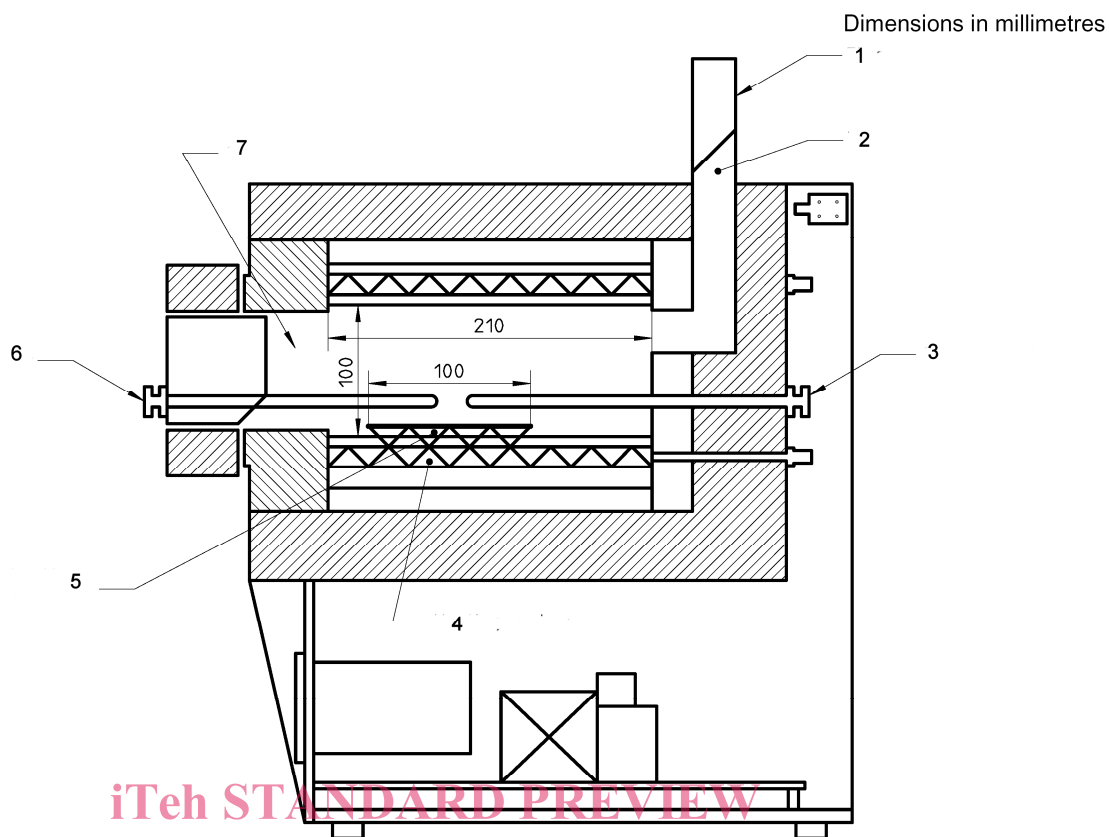
5.4 Crucible stand

The crucible stand on which the crucible is placed in the furnace, shall be such that the appropriate rate of heating can be achieved. For example, it may consist of the following:

- a) for single determinations, a ring of heat-resistant steel wire as shown in Figure 3 a) with ceramic discs, 25 mm diameter and 2 mm thick, resting on the inner projection of its legs; or
- b) for multiple determinations, a tray of heat-resistant steel wire as shown in Figure 3 b), of appropriate size, with ceramic plates 2 mm thick supporting the crucibles.

5.5 Balance

The balance shall be capable of reading to the nearest 0,1 mg.

**Key**

- 1 Flue
- 2 Valve
- 3 Thermocouple
- 4 Heating system
- 5 Zone of uniform temperature
- 6 Check thermocouple
- 7 Chamber (width 200 mm)

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Figure 1 — Example of suitable furnace