



SLOVENSKI STANDARD
SIST-TS CEN/TS 15148:2006

01-marec-2006

Trda goriva - Metod za določitev vsebnosti volatilenih snovi

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

Feste Biobrennstoffe - Verfahren zur Bestimmung des Gehaltes an flüchtigen Substanzen

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Biocombustibles solides - Méthode pour la détermination de la teneur en composé volatil

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ICS:

75.160.10 Trda goriva Solid fuels

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 15148

December 2005

ICS 75.160.10

English Version

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

Combustibles solides - Méthode de détermination de la
teneur en matières volatiles

Feste Biobrennstoffe - Verfahren zur Bestimmung des
Gehaltes an flüchtigen Substanzen

This Technical Specification (CEN/TS) was approved by CEN on 4 June 2005 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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

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Foreword

This Technical Specification (CEN/TS 15148:2005) has been prepared by Technical Committee CEN/TC 335 “Solid Biofuels”, the secretariat of which is held by SIS.

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

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Introduction

The volatile matter 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 working document aims to define the requirements and method used for the determination of volatile matter 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 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 14774-3, *Solid biofuels – Methods for the determination of moisture content – Oven dry method – Part 3: Moisture in general analysis sample*

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

3 Terms and definitions

For the purposes of this Technical Specification, 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 $900\text{ °C} \pm 10\text{ °C}$ 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.

5 Apparatus

5.1 Furnace

The furnace shall be heated by electricity, in which a zone of uniform temperature of $900\text{ °C} \pm 10\text{ °C}$ 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 $900\text{ °C} \pm 10\text{ °C}$, 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.

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.

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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 Thermocouple

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.

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5.5 Balance

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

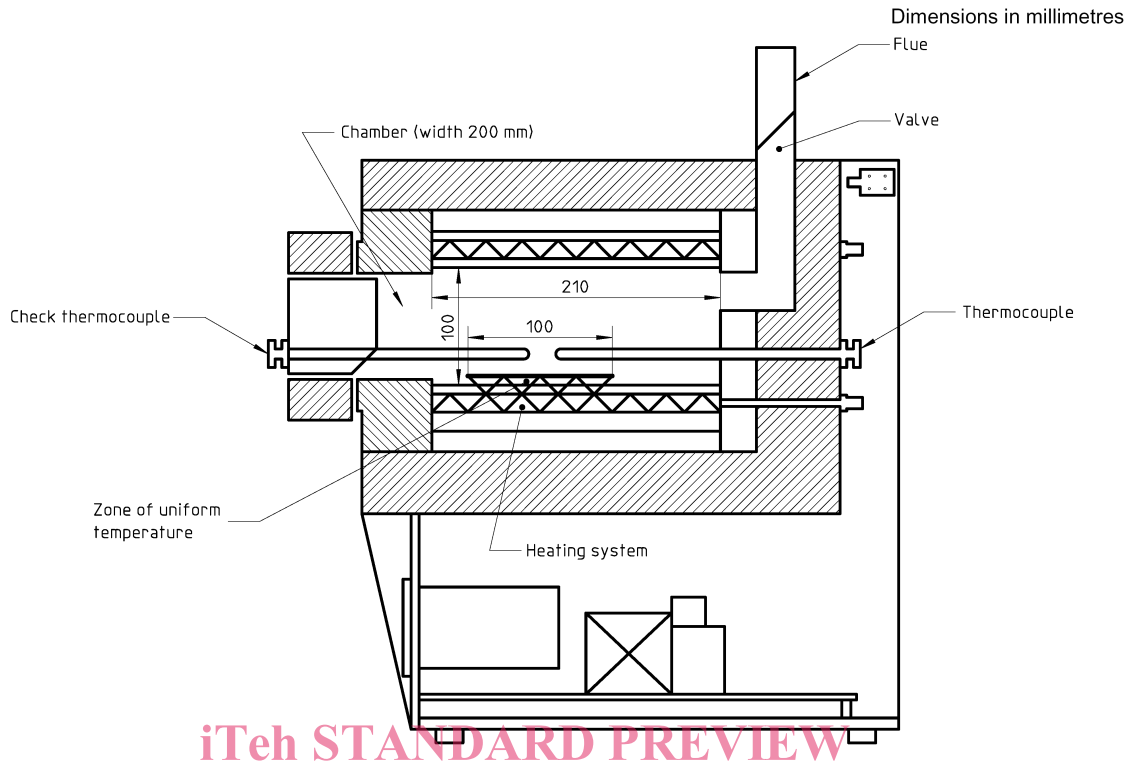


Figure 1 — Example of suitable furnace

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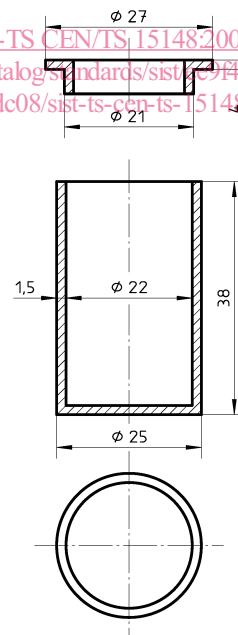


Figure 2 — Silica crucible and lid