



SLOVENSKI STANDARD
SIST EN 15402:2011

01-maj-2011

Nadomešča:

SIST-TS CEN/TS 15402:2007

Trdna alternativna goriva - Določevanje hlapnih snovi

Solid recovered fuels - Determination of the content of volatile matter

Feste Sekundärbrennstoffe - Bestimmung des Gehaltes an flüchtigen Substanzen

Combustibles solides de récupération - Détermination de la teneur en composés volatils
iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: ~~SIST EN 15402~~ EN 15402:2011

<https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921d02411/sist-en-15402-2011>

ICS:

75.160.10 Trda goriva

Solid fuels

SIST EN 15402:2011

en,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 15402:2011

<https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011>

EUROPEAN STANDARD

EN 15402

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2011

ICS 75.160.10

Supersedes CEN/TS 15402:2006

English Version

Solid recovered fuels - Determination of the content of volatile matter

Combustibles solides de récupération - Détermination de la teneur en composés volatils

Feste Sekundärbrennstoffe - Bestimmung des Gehaltes an flüchtigen Substanzen

This European Standard was approved by CEN on 22 January 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, 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 United Kingdom.

[SIST EN 15402:2011](https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011)<https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011>EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle	5
5 Apparatus	5
6 Sampling and sample preparation	9
7 Procedure	9
8 Calculation	10
9 Precision	10
10 Test report	10
Annex A (informative) Interlaboratory test results	12
Bibliography	15

[SIST EN 15402:2011](https://standards.itech.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011)
<https://standards.itech.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011>

Foreword

This document (EN 15402:2011) has been prepared by Technical Committee CEN/TC 343 "Solid recovered fuels", the secretariat of which is held by SFS.

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 September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

This document supersedes CEN/TS 15402:2006.

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 differs from CEN/TS 15402:2006 mainly as follows:

- a) use of automatic equipments under specific conditions permitted;
- b) results of interlaboratory tests supplemented as an informative Annex A;
- c) whole document editorially revised.

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, Croatia, 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 United Kingdom.

Introduction

The volatile matter is determined as the loss in mass less that due to moisture, when solid recovered fuel 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 recovered fuel during heating to prevent oxidation. The fit of the crucible lid is therefore critical.

The moisture content of the sample is determined at the same time as the volatile matter so that the appropriate correction can be made. Mineral matter associated with the sample can also lose mass under the conditions of the test, the magnitude of the loss being dependent on both the nature and the quantity of the minerals present.

This European Standard is primarily geared toward laboratories, producers, suppliers and purchasers of solid recovered fuels, but is also useful for the authorities and inspection organizations.

The method specified in this European Standard is based on EN 15148 as well as ISO 562.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 15402:2011](https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011)

<https://standards.iteh.ai/catalog/standards/sist/824fb4c1-d0a2-44d3-b62f-82921f902411/sist-en-15402-2011>

1 Scope

This European Standard specifies the requirements and a method for the determination of volatile matter of solid recovered fuels.

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.

EN 15357:2011, *Solid recovered fuels — Terminology, definitions and descriptions*

EN 15414-3, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 3: Moisture in general analysis sample*

EN 15442, *Solid recovered fuels — Methods for sampling*

EN 15443, *Solid recovered fuels — Methods for the preparation of the laboratory sample*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15357:2011 apply.

4 Principle

A test portion of the general analysis sample is heated out of contact with ambient air at (900 ± 10) °C for about 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 electrically and capable of maintaining a zone with uniform temperature of (900 ± 10) °C. It may be of the stop-ended type or fitted at the back with a flue with a diameter of about 25 mm and a length of about 150 mm (see Figure 1).

NOTE 1 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.

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

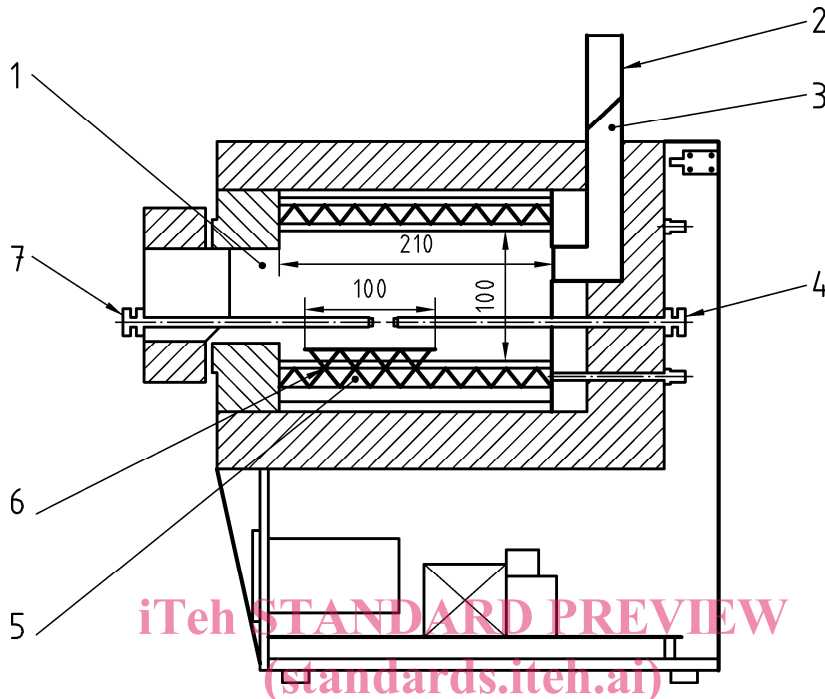
NOTE 2 Observing the temperature is very important in order to compensate for inherent deviations of the temperature measurement and lack of uniformity regarding the temperature distribution.

Usually 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. In the first case, the zone of uniform temperature shall be at least 160 mm × 100 mm; in the latter case, a zone of diameter about 40 mm is sufficient.

EN 15402:2011 (E)

A position for the crucible stand shall be chosen within the zone of uniform temperature and this position shall be used for all determinations.

Dimensions in millimetres



Key

- | | | | |
|---|-----------------------|---|-----------------------------|
| 1 | chamber, 200 mm width | 5 | heating system |
| 2 | flue | 6 | zone of uniform temperature |
| 3 | valve | 7 | check thermocouple |
| 4 | thermocouple | | |

Figure 1 — Example of suitable furnace

5.2 Thermocouple

The thermocouple shall be unsheathed, of wire with a thickness ≤ 1 mm. It should be long enough to reach the centre of the underside of each crucible when placed into the zone of uniform temperature on being inserted through the front or rear of the furnace. The thermo junction shall be placed midway between the base of the crucible in its stand and the floor of the furnace. If the stand holds more than one crucible, the temperature under each crucible shall be checked in the same manner.

If desired, a sheathed thermocouple may be permanently installed in the furnace (5.1) (see Figure 1) with its thermo junction as close as possible to the centre of the zone of uniform temperature; in this case furnace temperature readings shall be correlated at frequent intervals with those of the unsheathed thermocouple which is thus inserted only if necessary.

NOTE The temperature/electromotive force relationship of a thermo junction maintained at elevated temperatures gradually changes with time.

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 from 10 g to 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 such 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.

Dimensions in millimetres

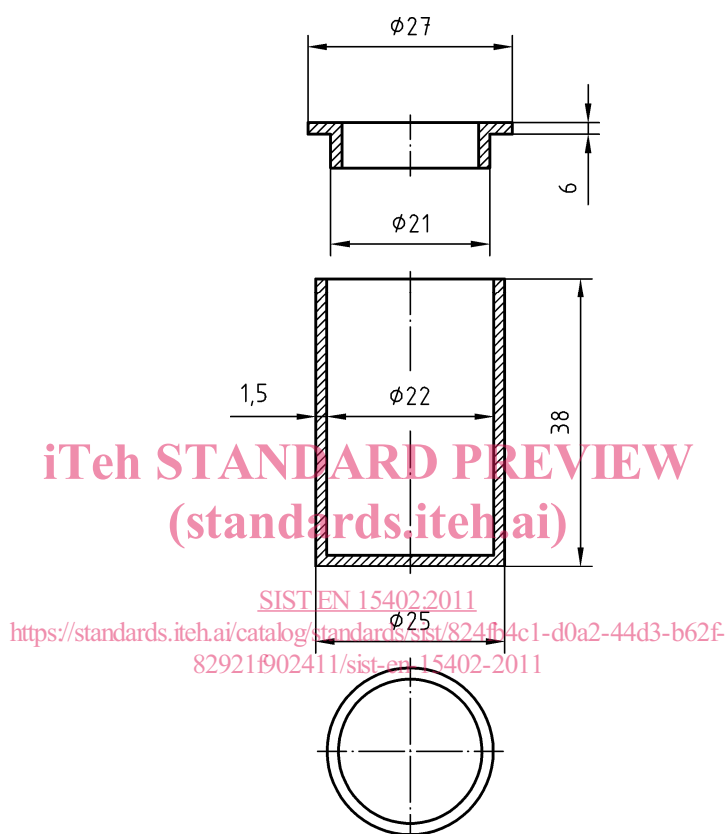


Figure 2 — Silica crucible and lid

If performing multiple determinations on highly swelling solid recovered fuels, it can be necessary to use taller crucibles; these may be up to 45 mm in height without affecting the determined volatile matter, provided that the specified rate of temperature recovery is maintained.

5.4 Crucible stand

The crucible stand which the crucible (5.3) is placed on in the furnace (5.1), shall be such that the appropriate rate of heating is achievable. 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 with a diameter of about 25 mm and a thickness of about 2 mm, 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 with a thickness of about 2 mm supporting the crucibles.