



SLOVENSKI STANDARD
SIST-TS CEN/TS 15414-3:2007

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Trda goriva - Določitev vsebnosti vlage s pomočjo sušilne metode -
Del 3: Vsebnost vlage v splošni analitični vzorci

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

Feste Sekundärbrennstoffe - Bestimmung des Wassergehaltes unter Verwendung des
Verfahrens der Ofentrocknung - Teil 3: Wassergehalt in gewöhnlichen Analysenproben

Combustibles solides de récupération - Détermination de l'humidité par la méthode de
séchage a l'étuve - Partie 3: Humidité de l'échantillon pour analyse générale

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Ta slovenski standard je istoveten z: CEN/TS 15414-3:2006

ICS:

75.160.10 Trda goriva Solid fuels

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ICS 75.160.10

English Version

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

Combustibles solides de récupération - Détermination de
l'humidité par la méthode de séchage à l'étuve - Partie 3:
Humidité de l'échantillon pour analyse générale

Feste Sekundärbrennstoffe - Bestimmung des
Wassergehaltes unter Verwendung des Verfahrens der
Ofentrocknung - Teil 3: Wassergehalt in gewöhnlichen
Analysenproben

This Technical Specification (CEN/TS) was approved by CEN on 25 March 2006 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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Foreword

This document (CEN/TS 15414-3:2006) has been prepared by Technical Committee CEN/TC 343 “Solid recovered fuels”, the secretariat of which is held by SFS.

CEN/TS 15414 “*Solid recovered fuels — Determination of moisture content using the oven dry method*” consists of three parts:

Part 1: Determination of total moisture by a reference method

Part 2: Determination of total moisture by a simplified method

Part 3: Moisture in general analysis sample

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This Technical Specification specifies a method for the determination of moisture in an analysis sample by drying the sample in an oven. This method is suitable for use for general analysis samples in accordance with CEN/TS 15414-1. It is applicable to all solid recovered fuels.

NOTE 1 The term moisture content when used with recovered materials can be misleading since solid recovered materials e.g. biomass frequently contain varying amounts of volatile compounds (extractives) which can evaporate when determining the moisture content of the general analyses sample by oven drying.

NOTE 2 This Technical Specification is based on CEN/TS 14774-3 [1].

2 Normative references

The following referenced documents are indispensable for the application of this Technical Specification. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CEN/TS 15357:2006, *Solid recovered fuels — Terminology, definitions and descriptions*

prCEN/TS 15443, *Solid recovered fuels — Methods for laboratory sample preparation*

3 Terms and definitions

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For the purposes of this Technical Specification, the terms and definitions given in CEN/TS 15357:2006 apply.

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4 Principle

The analysis sample of recovered fuel is dried at a temperature of 105 °C under air atmosphere, nitrogen atmosphere or vacuum conditions. The percentage of moisture is calculated from the loss in mass of the test sample. If the sample material is susceptible to oxidation (at 105 °C), drying in nitrogen atmosphere or vacuum conditions is performed (see prCEN/TS 15442 [2] and ISO 331 [3]).

5 Apparatus

5.1 Drying oven, capable of being controlled at (105 ± 2) °C (see declaration of the manufacturer) and in which the air atmosphere changes between three and five times per hour. The air velocity shall be such that the sample particles are not dislodged from their weighing dish (5.2).

NOTE For the use of nitrogen atmosphere, see ISO 331 [3]; for the use of vacuum drying oven, see [4].

5.2 Weighing dish, of glass or corrosion- and temperature resistant material, with a well-fitting lid and of such a size that the sample layer does not exceed 0,2 g/cm².

5.3 Balance, with a sufficient accuracy to weigh the sample to the nearest 0,1 mg.

5.4 Dessicator, to avoid absorption of moisture from the atmosphere to the sample.

6 Sample preparation

The sample used for the determination shall be the general analysis test sample with a particle size of 1 mm or less, prepared in accordance with prCEN/TS 15443.

Before commencing the determination, mix the analysis sample preferably by mechanical means.

7 Procedure

A minimum of two determinations shall be carried out on the test sample.

Dry an empty weighing dish (5.2) with its lid at $(105 \pm 2) ^\circ\text{C}$ until constant mass is reached and allow it to cool to room temperature in the dessicator (5.4).

NOTE 1 Several weighing dishes can be handled at the same time.

Weigh the weighing dish (5.2) with its lid to the nearest 0,1 mg.

Add minimum 1 g of the analysis sample into the weighing dish (5.2) in an even layer and weigh the weighing dish with its lid plus sample to the nearest 0,1 mg.

Heat the uncovered weighing dish (5.2) and its lid together with the sample at $(105 \pm 2) ^\circ\text{C}$ until constant mass is reached. Constancy in mass is defined as a change not exceeding 1 mg in mass during a further period of heating at $(105 \pm 2) ^\circ\text{C}$ over a period of 60 min. If the sample material is susceptible to oxidation at the given temperature, dry in nitrogen atmosphere or under vacuum conditions (see [1]) and [2]). Report the drying atmosphere.

NOTE 2 The drying time required is usually between 2 h to 3 h.

WARNING — For some materials present in solid recovered fuels there can be a risk of self-ignition when drying at $105 ^\circ\text{C}$.

Replace the lid while the weighing dish (5.2) is still in the drying oven (5.1). Transfer the weighing dish and its contents to the dessicator (5.4). Allow it to cool to room temperature.

Weigh the weighing dish (5.2) and its lid with the sample to the nearest 0,1 mg. Since small particle size recovered fuels are very hygroscopic, weigh rapidly once the sample is cooled.

NOTE 3 Since recovered fuels in small particle size are very hygroscopic, their moisture content will vary with change of humidity of the atmosphere and therefore, the moisture of the analyses sample should always be determined simultaneously when portions are weighed out for other analytical determinations, for example, calorific value, carbon, nitrogen.

8 Calculation

For each determination, the moisture content, M_{ad} , in the analysis sample, as analysed, expressed as a percentage by mass, shall be calculated using Equation (1):

$$M_{\text{ad}} = \frac{(m_2 - m_3)}{(m_2 - m_1)} \times 100 \quad (1)$$

where

- m_1 is the mass of the empty weighing dish (5.2) plus lid, in grams;
- m_2 is the mass of the weighing dish (5.2) plus lid plus sample before drying, in grams;
- m_3 is the mass of the weighing dish (5.2) plus lid plus sample after drying, in grams.

The test result for each individual determination shall be calculated on analysed basis to two decimal places and for reporting purposes, the mean value of the individual test results shall be calculated and rounded to the nearest 0,1 %.

9 Precision

9.1 Repeatability

The result of duplicate determinations, carried out in the same laboratory, by the same operator, with the same apparatus on representative portions weighed out at the same time from the analysis sample, shall not differ more than 0,2 % absolute.

9.2 Reproducibility

Because of the varying nature of the solid recovered fuels covered by this Technical Specification, at the present time it is not possible to give a precision statement (reproducibility) for this test method.

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10 Test report

The test report shall include at least the following information:

- a) identification of the laboratory and the testing date;
- b) identification of the product or sample tested;
- c) a reference to this Technical Specification, i.e. CEN/TS 15414-3;
- d) any deviation from this Technical Specification;
- e) drying atmosphere used;
- f) test results on wet basis as specified in Clause 8;
- g) any unusual features observed during the test procedure which may have affected the test result.