



SLOVENSKI STANDARD

SIST-TS CEN/TS 15149-1:2006

01-april-2006

Biobrennstoffe - Verfahren zur Bestimmung der Teilchengrößenverteilung - Teil 1:
Rüttelsiebverfahren mit Sieb-Lochgrößen von 3,15 mm und darüber

Solid biofuels - Methods for the determination of particle size distribution - Part 1:
Oscillating screen method using sieve apertures of 3,15 mm and above

Biocombustibles solides - Méthode de détermination de la distribution granulométrique -
Partie 1 : Méthode au tamis oscillant d'ouverture de mailles égale ou supérieure a 3,15
mm

Ta slovenski standard je istoveten z: CEN/TS 15149-1:2006

ICS:

75.160.10 Trda goriva Solid fuels

SIST-TS CEN/TS 15149-1:2006 en

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
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CEN/TS 15149-1

January 2006

ICS 75.160.10

English Version

Solid biofuels - Methods for the determination of particle size distribution - Part 1: Oscillating screen method using sieve apertures of 3,15 mm and above

Combustibles solides - Méthode de détermination de la granularité - Partie 1 : Méthode au tamis oscillant, d'ouverture de mailles égale ou supérieure à 3,15 mm

Feste Biobrennstoffe - Verfahren zur Bestimmung der Teilchengrößenverteilung - Teil 1: Rüttelsiebverfahren mit Sieb-Lochgrößen von 3,15 mm und darüber

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.

CEN members are the national standards bodies of 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 United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This Technical Specification (CEN/TS 15149-1:2006) has been prepared by Technical Committee CEN/TC 335 "Solid Biofuels", the secretariat of which is held by SIS.

CEN/TS 15149 consists of the following parts under the general title *Solid biofuels - Methods for the determination of particle size distribution*:

Part 1: Oscillating screen method using sieve apertures of 3,15 mm and above

Part 2: Vibrating screen method using sieve apertures of 3,15 mm and below

Part 3: Rotary screen method

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 United Kingdom.

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CEN/TS 15149-1:2006 (E)**Introduction**

Part 1 describes the reference method for size classification of samples with a nominal top size of 3,15 mm and over.

Part 2 describes the reference methods for all samples with a nominal top size below 3,15 mm.

Part 3 describes an innovative method, by which the degree of overestimating the fine particle fractions is reduced. As it is currently not generally available, it is here proposed, for research and development purposes or for individual quality management processes, that the quality requirements are bilaterally defined between the suppliers and consumers based on this method.

NOTE The nominal top size is defined as the aperture size of the sieve where at least 95 % by mass of the material passes (see Bibliography).

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1 Scope

This Technical Specification specifies a method for the determination of the size distribution of particulate biofuels by the oscillating screen method. The method described is meant for particulate biofuels only, namely materials that either have been reduced in size, such as most wood fuels, or are physically in a particulate form, e.g. olive stones, nut shells, grain, etc. This document applies to particulate compressed and uncompressed fuels with a nominal top size of 3,15 mm and over, e.g. wood chips, hog fuel, olive stones etc.

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 14778-1, *Solid biofuels – Sampling – Part 1: Methods for sampling*

CEN/TS 14778-2, *Solid biofuels – Sampling – Part 2: Method for sampling particulate material transported in lorries*

CEN/TS 14779, *Solid biofuels – Sampling – Methods for preparing sampling plans and sampling certificates*

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

CEN/TS 14774-1, *Solid biofuels – Methods for determination of moisture content – Oven dry method, Part 1: Total moisture – Reference method*

CEN/TS 14774-2, *Solid biofuels – Methods for determination of moisture content – Oven dry method, Part 2: Total moisture – Simplified procedure*

CEN/TS 15149-2, *Solid biofuels - Methods for the determination of particle size distribution - Part 2: Vibrating screen method using sieve apertures of 3,15 mm and below*

ISO 3310-2 *Test sieves – Technical requirements and testing – Part 2. Test sieves of perforated metal plate*

3 Terms and definitions

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

3.1

nominal top size

aperture size of the sieve where at least 95 % by mass of the material passes

CEN/TS 15149-1:2006 (E)**4 Principle**

A sample is subjected to sieving through horizontally oscillating sieves, sorting the particles in decreasing size classes by either manual or mechanical means.

5 Apparatus**5.1 Sieves**

For the test, an appropriate number of either circular or rectangular sieves with a minimum effective sieve area of 1200 cm² is required. The geometry of the apertures, the thickness of the sieves, the hole distances and the diameter of the holes shall be in accordance with the requirements of ISO 3310-2. The frame of the sieves shall have a height that enable the sieves to contain the sample and allows a free movement of the sample during the sieving process.

NOTE 1 For materials with a nominal top size of less than 10 mm an effective sieve area of less than 1200 cm² is adequate.

The number of sieves and the aperture sizes of the sieves shall be chosen according to the size specification of the sample material.

NOTE 2 It is recommended to use sieves with hole diameters of 3,15 mm, 16 mm, 45 mm and 63 mm, if the measurement aims at the determination of conformity with CEN/TS 14961. For further resolution in the size distribution and for avoiding any overloading of one fraction the addition of an 8 mm sieve to the sieve set is also recommended. For further size distribution determination of the fraction that passes the last sieve see CEN/TS 15149-2.

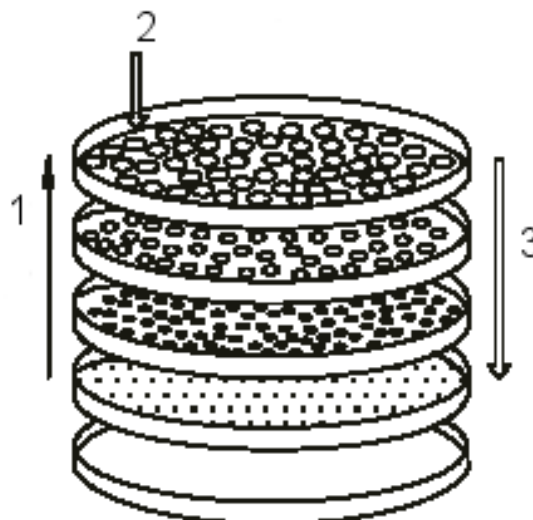
5.2 Collecting pan

For collecting of material passing through the sieves, a collecting pan of adequate size is required.

5.3 Mechanical oscillating equipment

If a mechanical device is used the shaking operation shall be horizontally oscillating (one or two dimensional), using an appropriate stroke-frequency according to the type of material. For principle drawing of a mechanical oscillator see Figure 1.

NOTE Be aware that a too low shaking frequency may lead to incomplete particle separation. The minimum shaking frequency can be determined by pre-tests.

**Key**

- 1 Increasing hole diameters
- 2 Material addition
- 3 Material flow direction

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Figure 1: Principle of the sieving operation

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5.4 Balance <https://standards.iteh.ai/catalog/standards/sist/29a05e7c-5a3-458f-a6f2-188a5d673731/sist-ts-cen-ts-15149-1-2006>

A balance capable of measuring the mass of the sample to be sieved to the nearest 0,1 g.

6 Sample preparation

6.1 Sample size

The minimum size of the test sample for the determination of the size distribution shall be 8 l and shall have been sampled according to CEN/TS 14778-1, CEN/TS 14778-2 and CEN/TS 14779. For fine grade biofuels, where 100 % of the particles pass the sieve holes of 45 mm diameter, a smaller sample size of minimum 4 l can be used.

NOTE The sample should include material for determination of size distribution and moisture content.

Depending on the size of the sieves the test sample may have to be divided into several sub samples, which are processed in sequential sieving operations. This is to ensure that the filling height on the upper sieve shall never exceed 5 cm. This procedure of sequential processing also applies, if a larger sample than the above given 8 l is processed.

6.2 Sample preparation

The sample shall be sieved at a moisture content below 20 % wet base, thus preventing the particles from sticking together or losing moisture during the sieving process. If necessary the sample has to be pre-dried. Drying is done according to normative reference CEN/TS 14780.