



SLOVENSKI STANDARD

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Nadomešča:

SIST-TS CEN/TS 15149-1:2006

Trdna biogoriva - Določevanje porazdelitve velikosti delcev - 1. del: Nihalna zaslonska metoda z uporabo sita z odprtinami 1 mm in več

Solid biofuels - Determination of particle size distribution - Part 1: Oscillating screen method using sieve apertures of 1 mm and above

Feste Biobrennstoffe - Bestimmung der Partikelgrößenverteilung - Teil 1: Rüttelsiebverfahren mit Sieb-Lochgrößen von 1 mm und darüber

Biocombustibles solides - Détermination de la distribution granulométrique - Partie 1: Méthode au tamis oscillant d'ouverture de maille égale ou supérieure à 1 mm

Ta slovenski standard je istoveten z: EN 15149-1:2010

ICS:

75.160.10 Trda goriva Solid fuels

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15149-1

October 2010

ICS 75.160.10

Supersedes CEN/TS 15149-1:2006

English Version

**Solid biofuels - Determination of particle size distribution - Part
1: Oscillating screen method using sieve apertures of 1 mm and
above**

Biocombustibles solides - Détermination de la distribution
granulométrique - Partie 1: Méthode au tamis oscillant
d'ouverture de maille égale ou supérieure à 1 mm

Feste Biobrennstoffe - Bestimmung der
Partikelgrößenverteilung - Teil 1: Rüttelsiebverfahren mit
Sieb-Lochgrößen von 1 mm und darüber

This European Standard was approved by CEN on 26 September 2010.

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.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15149-1:2010) 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 April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

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 supersedes CEN/TS 15149-1:2006.

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

EN 15149, *Solid biofuels — Determination of particle size distribution*, consists of the following parts:

- *Part 1: Oscillating screen method using sieve apertures of 1 mm and above;*
- *Part 2: Vibrating screen method using sieve apertures of 3,15 mm and below.*

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 the United Kingdom.

EN 15149-1:2010 (E)**Introduction**

Part 1 describes the reference method for size classification of samples with a nominal top size of 1 mm and above.

Part 2 describes the reference method for size classification of samples with a nominal top size below 3,15 mm.

Manual sieving is not included in this standard, as no data is available which supports that manual sieving operations are comparable to the here described mechanical sieving operations.

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1 Scope

This European Standard specifies a method for the determination of the size distribution of particulate biofuels by the horizontally oscillating screen method. It applies to particulate uncompressed fuels with a nominal top size of 1 mm and above as 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.

EN 14588:2010, *Solid biofuels — Terminology, definitions and descriptions*

EN 14774-1:2009, *Solid biofuels — Determination of moisture content — Oven dry method — Part 1: Total moisture — Reference method*

EN 14774-2:2009, *Solid biofuels — Determination of moisture content — Oven dry method — Part 2: Total moisture — Simplified method*

prEN 14778, *Solid biofuels — Sampling*

prEN 14780, *Solid biofuels — Sample preparation*

EN 14961-1, *Solid biofuels — Fuel specifications and classes — Part 1: General requirements*

EN 15149-2, *Solid biofuels — Determination of particle size distribution — Part 2: Vibrating screen method using sieve apertures of 3,15 mm and below*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*
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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 document, the terms and definitions given in EN 14588:2010 and the following apply.

3.1

median value of the size distribution

value [d₅₀] that separates a distribution into two equal parts and that is graphically the intercept point of the cumulative size distribution curve with the 50 %-horizontal line

4 Principle

A sample is subjected to sieving through horizontally oscillating sieves, sorting the particles in decreasing size classes by 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 1 200 cm² is required. The geometry of the apertures shall be in accordance with the requirements of ISO 3310-1 and -2, respectively. The frame of the sieves shall have a height that enables the sieves to contain the sample and allows a free movement of the sample during the sieving process.

EN 15149-1:2010 (E)

NOTE 1 For materials with a nominal top size of less than 10 mm, an effective sieve area of less than 1 200 cm² is adequate.

The number of sieves and the aperture sizes of the sieves shall be chosen according to the size specification of the actual sample material, see EN 14961-1. Sieves should correspond to ISO 3310-1 (1 mm) and ISO 3310-2 (all aperture sizes above 1 mm).

NOTE 2 For samples of wood chips e.g. the following set of sieves may apply: 3,15 mm, 8,0 mm, 16 mm, 31,5 mm, 45 mm, 63 mm. If experience shows that no particles are caught by the larger sieves, these can be omitted from the set. For further size distribution determination of the fraction that passes the 3,15 mm sieve, see EN 15149-2.

NOTE 3 Sieve sizes above 63 mm are not useful as the shaking operation will not force the particles to orientate vertically to the plane of the sieves. Furthermore the vertical distance to the following sieve will have to be longer than the usual 80 mm in order to allow the long and slim particles to pass through the holes.

In the case of checking the fulfilment of particle size demands of a certain quality class given in EN 14961-1, only those sieve sizes which have limit values are necessary to be chosen.

5.2 Collecting pan.

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

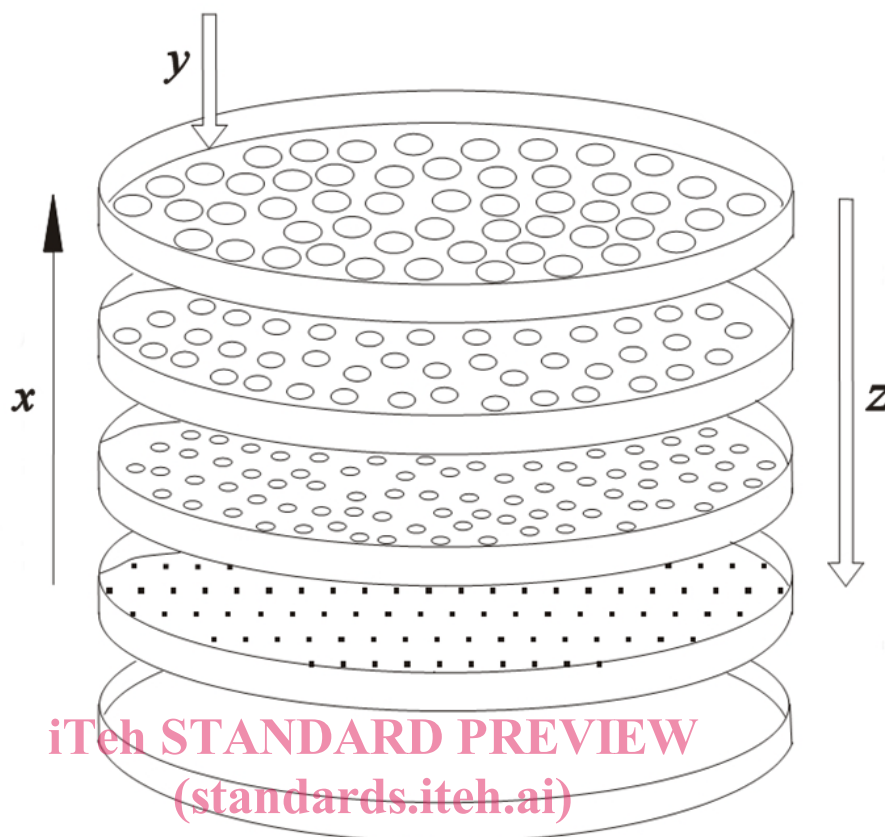
5.3 Mechanical sieving equipment.

The sieving operation shall be horizontally oscillating (one or two dimensional), using an appropriate stroke-frequency according to the type of material. For principle drawing of the sieving operation, see Figure 1.

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

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Key

- x Increasing hole diameters
- y Material addition
- z Material flow direction

Figure 1 — Principle of the sieving operation

5.4 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 be sampled according to prEN 14778. For biofuels, where 100 % of the particles will pass the holes of a 45 mm aperture size sieve, 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.