# SLOVENSKI STANDARD
# SIST-TS CEN/TS 15149-2:2006

**01-april-2006**

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**Trdna biogoriva ï Metode doloļ anja porazdelitve velikosti delcev ï 2. del: Vibracijska zaslonska metoda z uporabo sita z odprtinami 3,15 mm in manj**

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

Feste Biobrennstoffe - Verfahren zur Bestimmung der Teilchengrößenverteilung - Teil 2: Rüttelsiebverfahren mit Sieb-Lochgrößen von 3,15 mm und darunter

Biocombustibles solides - Méthode de détermination de la distribution granulométrique - Partie 2 : Méthode au tamis vibrant d'ouverture de mailles inférieure a 3,15 mm



**Ta slovenski standard je istoveten z:** **CEN/TS 15149-2:2006**

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**ICS:**

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|---|---|---|
| 75.160.10 | Trda goriva | Solid fuels |

**SIST-TS CEN/TS 15149-2:2006** **en**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

# CEN/TS 15149-2

January 2006

ICS 75.160.10

English Version

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

Combustibles solides - Méthode de détermination de la granularité - Partie 2 : Méthode au tamis vibrant, d'ouverture de mailles inférieure ou égale à 3,15 mm

Feste Biobrennstoffe - Verfahren zur Bestimmung der Teilchengrößenverteilung - Teil 2: Rüttelsiebverfahren mit Sieb-Lochgrößen von 3,15 mm und darunter

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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Ref. No. CEN/TS 15149-2:2006: E

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## Foreword

This Technical Specification (CEN/TS 15149-2:2006) 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.

## 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)

## 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. This document applies to particulate fuels with a nominal top size less than 3,15 mm (e.g. sawdust).

## 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 – Part 3: Method for preparing sampling plans and sampling certificates*



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

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



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

ISO 3310-1, *Test sieves – Technical requirements and testing – Part 1. Test sieves of metal wire cloth*

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

## 4 Principle

A sample is subjected to sieving through vibrating sieves, sorting the particles in decreasing size classes by mechanical means.

NOTE A manual sieving is here excluded due to the fact that small sieve holes may easily be clogged by particles.

# 5 Apparatus

## 5.1 Sieves

For the test, an appropriate number of either circular or rectangular sieves with a minimum effective sieve area of 250 $cm^2$ 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 ISO 3310-1 and ISO 3310-2. The frame of the sieves shall have a height that enable the sieves to contain the samples and allows a free movement of the sample during the sieving process.

The number of sieves and the aperture sizes of the sieves shall be chosen according to the size specification of the sample material. For sawdust it is recommended to use the following sieve set:

3,15 mm round holes

2,8 mm mesh wire cloth

2,0 mm mesh wire cloth

1,4 mm mesh wire cloth

1,0 mm mesh wire cloth

0,5 mm mesh wire cloth

0,25 mm mesh wire cloth



## 5.2 Collecting pans



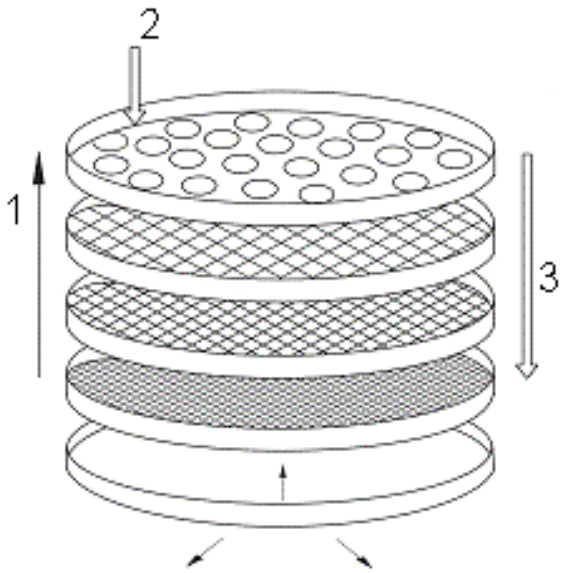
For weighing of the size classes an adequate number of collecting pans is required.

## 5.3 Flat brush

For cleaning the sieves a flat brush is required.

## 5.4 Mechanical vibrating equipment

A mechanical device that applies a vibrating movement in three dimensions. For principle drawing of the vibrating sieving operation see Figure 1.




**Key**

1 Increasing hole diameters
2 Material addition
3 Material flow direction



**Figure 1: Principle of the sieving operation.**



### 5.5 Balance

A balance, capable of measuring the mass of the sample to be sieved to the nearest 0,01 g.

## 6 Sample preparation

### 6.1 Sample size

The minimum size of the test sample for the determination of the size distribution shall be 50 grams and shall have been sampled according to CEN/TS 14778-1, CEN/TS 14778-2 and CEN/TS 14779.

### 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 loosing moisture during the sieving process. If necessary the sample has to be pre-dried. Drying is done according to CEN/TS 14780.

NOTE By pre-drying, as described in CEN/TS14780, the sample is brought into equilibrium with the humidity of the surrounding atmosphere.

Determine the moisture content of the material to be sieved on a separate sub-sample following the procedure given in CEN/TS 14774-1 or CEN/TS 14774-2. The moisture content shall be determined and reported concurrently with the particle size distribution determination.