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Fasta biobränslen – Metoder för bestämning av partikelstorleksfördelning – Del 3: Metod – Roterande såll

Solid biofuels – Methods for the determination of particle size distribution – Part 3: Rotary screen method
This Technical Specification is not a Swedish Standard. This document contains the English version of CEN/TS 15149-3:2006.
Solid biofuels - Methods for the determination of particle size
distribution - Part 3: Rotary screen method

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Foreword

This Technical Specification (CEN/TS 15149-3:2006) 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 announce this CEN 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, 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 rotary 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, nutshell, grain etc. This document applies to particulate 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 – Part 3: Method for preparing sampling plans and sampling certificates

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


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
4 Principle

A sample is subjected to sieving through sieves in a rotary sieving machine sorting the particles by increasing size.

5 Apparatus

5.1 Rotary screen

For the test a rotary sieving device is required for which the operating principle is shown in Figure 1. The rotary sieving device consists of five joined cylindrical sieve rings each with an inner diameter of 500 mm (+/- 15 mm). The height (length) of each of the 5 sieve rings is 400 mm with a maximum of 20 mm imperforated (“blind”) surface at each side; as a consequence each ring is having an effective sieving length of 360 mm or higher. All five cylinder rings (sieves) are evenly long and consecutively connected to each other, thus forming a drum. The inner surface of the drum shall be constructed in a way, which allows the particles to slide from one ring to another without interruption. Downward to the direction of flow the drum is inclined at an angle of 3 degrees (+/- 0.2 degrees) towards the horizontal ground. The drum shall be rotating at a speed 16 rotations per minute.

Due to both inclination and rotation of the drum, the sample is continuously being transported forward in the drum over the rotating sieves. Thereby the particles are separated by their size by passing through the sieve holes and falling into individual collecting pans underneath each sieve cylinder. Large particles, which have not passed through any sieve holes, are finally being discharged from the drum into a final collecting pan. The size of each individual pan should be at least 70% of the initial test sample volume.

![Figure 1: Operating principle of rotating sieves](image)

Key

1 Material addition
2 Increasing hole diameter
3 Collecting pans
4 Material-flow direction

The geometry of the apertures and the thickness of the sieves shall be in accordance with ISO 3310-2. The aperture sizes of the sieves shall be chosen according to the size specification of the sample material. It is