TECHNICAL SPECIFICATION

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CEN/TS 15406

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English Version

Solid recovered fuels - Methods for the determination of bridging properties of bulk material

Combustibles solides de récupération - Méthodes pour la détermination des propriétés de formation de voûte dans les matériaux en vrac

Feste Sekundärbrennstoffe - Verfahren zur Bestimmung der Neigung zur Brückenbildung von Schüttgut

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Contents

Foreword

This document (CEN/TS 15406:2006) has been prepared by Technical Committee CEN/TC 343 "Solid recovered fuels", the secretariat of which is held by SFS.

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.

Introduction

This Technical Specification describes the determination of bridging properties of solid recovered fuels (SRF), which is conveyable in a continuous material flow. Bridging or arching is a complex parameter describing the situation when particles form a stable bridge over an opening that can be several times the length of the single particles. Bridging is dependent on several influencing factors, e.g. the conveying or transport system, particle size and shape, moisture content, bulk density, bed depth.

The behaviour of SRF in bins, hoppers, feeders, and other handling equipment depends on bridging properties [1]. Knowing these properties, already in phase of product development, is essential for avoiding flow problems.

Bridging properties are also important for quality control. By checking the relative bridging properties of a given bulk solid before it is placed into a system, unsatisfactory batches can be rejected or recycled, thereby preventing costly handling problems downstream.

Bridging is not an absolute value and therefore there is a need for standardising the conditions for the determination of bridging tendency in order to gain comparative measuring results.

Bridging of solid recovered fuels is subject to variation due to several impacts such as filling layer, particle shape, and storage time in silos. Measured bridging values can therefore deviate from real conditions in silos and conveyer systems.

1 Scope

This Technical Specification specifies a method for the determination of bridging properties of solid recovered fuels using standard measuring equipment. The method is applicable to all particulate recovered fuels that either have been reduced in size (such as cut tyres, plastics, cardboards) or physically in a particulate form (such as pellets, granules or fluff obtained from waste materials or dry sewage sludge).

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 15442, *Solid recovered fuels — Methods for sampling*

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

CEN/TS 15414-1, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 1: Determination of total moisture by a reference method*

CEN/TS 15414-2, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 2: Determination of total moisture by a simplified method*

CEN/TS 15415, *Solid recovered fuels — Determination of particle size distribution by screen method*

3 Terms and definitions

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

4 Determination of bridging properties for non coalescing materials

4.1 Principle

A sample is subjected to bridging by placing it over an expandable slot opening in an equipment of standardised dimensions. By increasing the slot opening, the building of a bridge is facilitated which ultimately will collapse and represent the bridging value of the tested fuel.

4.2 Apparatus

4.2.1 Bridging apparatus, consisting of a container with an effective area of $[(1,1 \pm 0,01) \times (2,0 \pm 0,01)]$ m and a minimum height of $(0,75 \pm 0,01)$ m. The sides of the container shall be manufactured of oriented strand board (OSB) plates.

The bottom of the container shall be made of two solid rubber mats with the following dimensions:

— width: $(1,1 \pm 0,01)$ m

— length: $(1,1 \pm 0,01)$ m

— thickness: $(0,01 \pm 0,001)$ m