SLOVENSKI STANDARD
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Trdna alternativna goriva - Specifikacije in razredi

Solid recovered fuels - Specifications and classes

Feste Sekundärbrennstoffe - Spezifikationen und Klassen

Combustibles solides de récupération - Spécification et classes

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English Version

Solid recovered fuels - Specifications and classes

Combustibles solides de récupération - Spécification et classes

Feste Sekundärbrennstoffe - Spezifikationen und Klassen

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Foreword

This document (prEN 15359:2009) has been prepared by Technical Committee CEN/TC 343 “Solid recovered fuels”, the secretariat of which is held by SFS.

This document is currently submitted to the CEN Enquiry.

This document will supersede CEN/TS 15359:2006.

The scope for this document is based on the mandate M/325 given by the European Commission to CEN on 2002-08-26.

Introduction

The objective of this document is to provide unambiguous and clear classification and specification principles for solid recovered fuels (SRF). The document aims at serving as a tool to enable efficient trading of SRF, promoting their acceptability on the fuel market and increasing the public trust. The document will facilitate a good understanding between seller and buyer, facilitate purchase, transborder movements, use and supervision as well as a good communication with equipment manufacturers. It will also facilitate authority permission procedures and ease the reporting on the use of fuels from renewable energy sources and on other environmental issues.

SRF are produced from non hazardous waste.[1)] The input waste can be production specific waste, municipal solid waste, industrial waste, commercial waste, construction and demolition waste, sewage sludge etc. It is thus obvious that SRF are a heterogeneous group of fuels. A well defined system for classification and specification is therefore of great importance to reach the above mentioned objectives and intentions.

This document covers all types of SRF and will thus have a wide field of application. It supports the objectives and implementation of the EU waste hierarchy as defined in article 3.1 of the waste framework directive 2006/12/EC. [1]

This document describes the compliance rules which SRF has to meet to be classified according to the classification system. It also describes how the supplier can establish a declaration of conformity to the different EN standards for SRF.

Figure 1 illustrates a simplified flow chain for SRF, from input of waste to end use of SRF. This document has an interface to all the stages in the chain, but SRF classification and specification are applicable at the point of delivery as shown in the figure. Requirements for how the input waste is collected and how to use the fuel are not part of this document.

1) Hazardous waste is defined in the Directive on hazardous waste (91/689/EEC) and its amendments, and are elucidated and exemplified in the waste list ((Commission decision 2000/532) and its amendments, in particular 2001/118/EC).

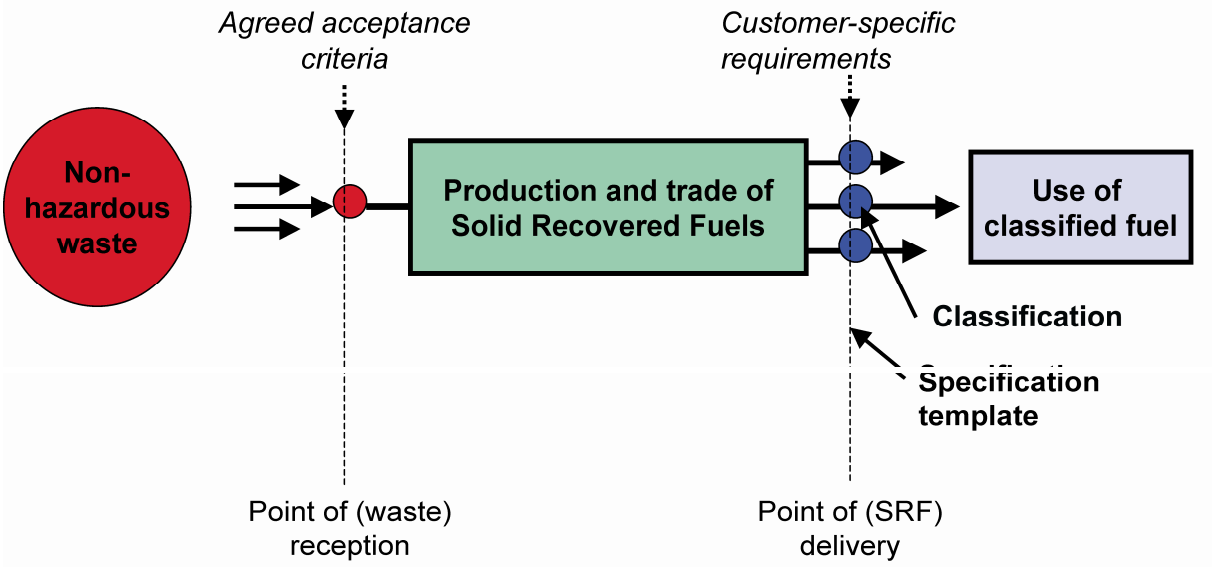

Figure 1 — Solid recovered fuels chain — The EN Standard on specifications and classes is applicable at the point of delivery

1 Scope

This document specifies a classification system for solid recovered fuels (SRF) and a template for the specifications of their properties.

SRF are produced from non-hazardous waste.

NOTE 1 Solid biofuels excluded from the Waste Incineration Directive (2000/76/EC) are not included in the scope of this document. These are dealt with in CEN/TC 335 “Solid biofuels”. Waste wood from demolition of buildings and civil engineering installations is, however, included in the scope.

NOTE 2 Untreated municipal solid waste is not included in the scope of this document.

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.

prEN 15357, *Solid recovered fuels — Terminology, definitions and descriptions*

prEN 15400, *Solid recovered fuels — Methods for the determination of calorific values (revision of CEN/TS 15400 as WI 00343046)*

prEN 15403, *Solid recovered fuels — Methods for the determination of ash content (revision of CEN/TS 15403:2006 as WI 00343049)*

prEN 15408, *Solid recovered fuels — Methods for the determination of sulphur (S), chlorine (Cl), fluorine (F) and bromine (Br) content (revision of CEN/TS 15408:2006 as WI 00343058)*

prEN 15411, *Solid recovered fuels — Methods for the determination of the content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Tl, V and Zn)(revision of CEN/TS 15411:2006 as WI 00343060)*

prEN 15414-1, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 1: Determination of total moisture by a reference method (revision of CEN/TS 15414-1:2006 as WI 00343053)*

prEN 15414-2, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 2: Determination of total moisture by a simplified method (revision of CEN/TS 15414-2:2006 as WI 00343054)*

prEN 15414-3, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 3: Moisture in general analysis sample (revision of CEN/TS 15414-3:2006 as 00343055)*

prEN 15415, *Solid recovered fuels — Determination of particle size and particle size distribution by screen method (revision of CEN/TS 15415:20086 as WIs 00343063, 00343064 and 00343065)*

prEN 15442, *Solid recovered fuels — Methods for sampling*

prEN 15443, *Solid recovered fuels — Methods for laboratory sample preparation*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in prEN 15357 and the following apply.

NOTE The terms and definitions 3.1 to 3.15 are identical with the ones given in prEN 15357.

3.1
classification of solid recovered fuels
grouping of solid recovered fuels into classes

NOTE The classes are defined by boundary values for chosen fuel characteristics to be used for trading as well as for information of permitting authorities and other interested parties.

3.2
combined sample
sample consisting of all the increments taken from a lot

NOTE The increments may be reduced by division before being added to the combined sample.

3.3
component
part of portion of a solid recovered fuels that can be separated by hand or by using simple physical means

3.4
composition
break down of solid recovered fuels by types of components e.g. wood, paper, board, textiles, plastics, rubber

3.5
delivery agreement
contract for fuel trade, which specifies e.g. origin and source, quality and quantity of the fuel, as well as delivery terms

3.6
increment
portion of fuel extracted in a single operation of the sampling device

NOTE Adapted from ISO 13909:2002.

3.7
laboratory sample
part of the sample sent to the laboratory

3.8
lot
defined quantity of fuel for which the quality is to be determined

NOTE 1 See also sub-lot.

NOTE 2 Adapted from ISO 13909:2003.

3.9
net calorific value
calculated value of the energy of combustion for unit of mass of a fuel burned in oxygen in calorimetric bomb under such conditions that all water of the reaction products remains as water vapour at 0,1 MPa

NOTE 1 The net caloric value can be determined at constant pressure or at constant volume. The net calorific value at constant pressure is however the generally used.

NOTE 2 Old term is lower heating value.

NOTE 3 See also calorific value and gross calorific value.

3.10
point of delivery
the location specified in the delivery agreement, at which the proprietary rights of and responsibility for a fuel are transferred from one organization or unit to an other

3.11
solid recovery fuels
solid fuel prepared from non-hazardous waste to be utilised for energy recovery in incineration or co-incineration plants and meeting the classification and specification requirements laid down in prEN 15359

NOTE "Prepared" here means processed, homogenised and up-graded to a quality that can be traded amongst producers and users.

3.12
specification
document stating requirements.

[EN ISO 9000:2005].

3.13
specification of solid recovered fuels
specification for the properties characterising a solid recovered fuel

NOTE A template for such specification is given in Annex A of prEN 15359.

3.14
sub-lot
part of a lot for which a test result is required

3.15
sub-sample
sample obtained by producers in which the items of interest are randomly distributed in parts of equal or unequal size

NOTE 1 A sub-sample is obtained by procedures in which the items of interest are randomly distributed in part of equal or unequal size.

NOTE 2 A sub-sample may be either a portion of the sample obtained by selection or division of the sample itself, or the final sample of a multistage sample preparation.

3.16
supplier
organisation or person that provides a product

4 Symbols and abbreviations

The symbols and abbreviations used in this EN standard comply with the SI system of units as far as possible.

Item	Symbol	Abbreviation
net calorific value	$q_{p,net}$	NCV
gross calorific value	$q_{V,gr}$	GCV
as received		ar
dry basis		d
particle diameter		*d*

5 Principles

The classification system is based on three important characteristics, referred to the main SRF characteristics: an economic characteristic (net calorific value), a technical characteristic (chlorine content) and an environmental characteristic (mercury content). The characteristics are chosen to give a stakeholder an immediate but simplified picture of the fuel in question.

Only fuels derived from non hazardous waste that meet the SRF EN-standards can be classified as SRF.

The classification itself is not enough for an intending user. A user has to have a more detailed description of the fuel. Relevant fuel properties are thus to be further specified. Some of the fuel properties are so important that they are obligatory to specify whereas others can be recorded voluntarily, e.g. upon request of the user.

It is important that SRF meet specified quality requirements which are to be determined based on a defined lot size by a minimum number of measurements.

6 Requirements and declaration of conformity

In conformity with this document, SRF shall comply with the following requirements:

a) SRF shall be classified according to the system in Clause 7;

b) SRF shall meet quality requirements according to given compliance rules in Clause 8;

c) SRF properties shall be specified according to Clause 9.

The producer/supplier shall give a declaration of conformity to this document. The record shall be kept available for inspection. A model template for the declaration is given in Annex C.

NOTE General criteria for a supplier's declaration is given in EN ISO/IEC 17050-1:2004 and EN ISO/IEC 17050-2:2004.

7 Classification

The classification system (Table 1) for SRF is based on limit values for three important fuel characteristics. These are:

a) the mean value for net calorific value (ar);

b) the mean value for chlorine content (d);

c) the median and 80th percentile values for mercury content (ar).

Each characteristic is divided into 5 classes. The SRF shall be assigned a class number from 1 to 5 for each characteristic. A combination of the class numbers makes up the class code (see example below). The characteristics are of equal importance and thus no single class number determines the code.

The class code shall be included in the specification as described in Clause 9.

Due to the statistical distribution pattern of the characteristics the values shall be presented as:

— net calorific value (NCV) mean (arithmetic);

— chlorine content (Cl) mean (arithmetic);

— mercury content (Hg) median and 80th percentile.

The higher of the two statistical values (median and 80th percentile) in a Hg data set determines the class.

EXAMPLE A SRF with a median value of 0,03 and a 80th percentile value of 0,07 belongs to Hg class 3. (according to Table 1).

For NCV, Cl and Hg the test methods in the corresponding EN-standards shall be used.

NOTE 1 80th percentile is the value on or below which 80 % of the observations fall.

NOTE 2 For details on statistics see CEN Report CEN/TR 15508 "Key properties of solid recovered fuels to be used for establishing a classification system"[6].

NOTE 3 The averages and percentiles are determined on the quantity of SRF as specified in Clause 8.

NOTE 4 The classes have been determined as a tool for identifying and pre-selecting SRF. However, the performances of the plant where SRF is used are depending on the properties of the SRF and more significantly on the design and operating conditions of such a plant.

NOTE 5 Not all kinds of SRF are suited for all types of installation (see CEN/TR 15508, Brussels, Belgium, 2006)[6]. For example, if 100 % SRF is used as fuel and an emission limit for Hg is defined at 0.05 mg/m^3, for cement and lime kilns as well as for power plants, Class Hg 1 fuels would fit to all types of these. Class Hg 5 fuels could only be used in these processes if this class of fuel is less than 100 % of the fuel mix. For other classes the specific transfer factor of a given process and the proportion of SRF will determine which classes can be used without improvement of the transfer conditions. Examples of transfer factors for existing processes are given in CEN/TR 15508.