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Solid biofuels — Fuel specifications and classes —

Part 2:
Graded wood pellets

Biocombustibles solides — Classes et spécifications des combustibles —

Partie 2: Classes de granulés de bois

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 238, *Solid biofuels*.

This second edition cancels and replaces the first edition (ISO 17225-2:2014), which has been technically revised. The main changes compared to the previous edition are as follows:

— ash melting behaviour as normative and threshold values for DT temperature added for Table 1

— maximum value for bulk density added for Table 1

— particle density and coarse pellet fines added as informative

A list of all parts in the ISO 17225 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The objective of the ISO 17225 series is to provide unambiguous and clear classification principles for solid biofuels; to serve as a tool to enable efficient trading of solid biofuels; to enable good understanding between seller and buyer as well as a tool for communication with equipment manufacturers. It also facilitates authority permission procedures and reporting.

This document supports the use of graded wood pellets for residential, small commercial and public buildings as well as industrial energy generation applications, which require classified pellet quality.

The residential, small and commercial and public building applications require higher quality fuel for the following reasons:

— Small-scale equipment does not usually have advanced controls and flue gas cleaning.

— Appliances are not generally managed by professional heating engineers.

— Appliances are often located in residential and populated districts.

NOTE 1 Pellets produced according to this document can be used in pellet stoves, which are tested according to European Standard EN 14785 [1], pellet burners tested according to EN 15270 [2] and pellet boilers or integrated-pellet burner systems tested according to EN 303–5 [3].

NOTE 2 For individual contracts, ISO 17225-1 can be used.

Although these product standards may be obtained separately, they require a general understanding of the standards based on and supporting ISO 17225-1. It is recommended to obtain and use ISO 17225-1 in conjunction with these standards.

Solid biofuels — Fuel specifications and classes —

Part 2: Graded wood pellets

1 Scope

This document determines the fuel quality classes and specifications of graded wood pellets for non-industrial and industrial use. This document covers only wood pellets produced from the following raw materials (see ISO 17225-1:2020, Table 1):

— 1.1 Forest, plantation and other virgin wood;

— 1.2 By-products and residues from wood processing industry;

— 1.3.1 Chemically untreated used wood.

Thermally treated biomass pellets (e.g. torrefied pellets) are not included in the scope of this document. Torrefaction is a mild pre-treatment of biomass at a temperature between 200 °C to 300 °C.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 14780, *Solid biofuels — Sample preparation*

ISO 16559, *Solid biofuels — Terminology, definitions and descriptions*

ISO 16948, *Solid biofuels — Determination of total content of carbon, hydrogen and nitrogen*

ISO 16968, *Solid biofuels — Determination of minor elements*

ISO 16994, *Solid biofuels — Determination of total content of sulfur and chlorine*

ISO 17225-1:2020[1)], *Solid biofuels — Fuel specifications and classes — Part 1: General requirements*

ISO 17827-1, *Solid biofuels — Determination of particle size distribution for uncompressed fuels — Part 1: Oscillating screen method using sieves with apertures of 3,15 mm and above*

ISO 17828, *Solid biofuels — Determination of bulk density*

ISO 17829, *Solid Biofuels — Determination of length and diameter of pellets*

ISO 17830, *Solid biofuels — Particle size distribution of disintegrated pellets*

ISO 17831-1, *Solid biofuels — Determination of mechanical durability of pellets and briquettes — Part 1: Pellets*

ISO 18122, *Solid biofuels — Determination of ash content*

ISO 18125, *Solid biofuels — Determination of calorific value*

1) Under preparation. Stage at the time of publication: ISO/FDIS 17225-1.

ISO 18134-1, *Solid biofuels — Determination of moisture content — Oven dry method — Part 1: Total moisture — Reference method*

ISO 18134-2, *Solid biofuels — Determination of moisture content — Oven dry method — Part 2: Total moisture — Simplified method*

ISO 18135, *Solid Biofuels — Sampling*

ISO 21404, *Solid biofuels — Determination of ash melting behaviour*

ISO 21945, *Solid biofuels — Simplified sampling method for small scale applications*

ISO 5370, *Solid biofuels — Determination of fines content in pellets*[2)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16559 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
additive
material which has been intentionally introduced into the fuel feed stock to improve quality of fuel (e.g. combustion or durability properties), to reduce emissions or to make production more efficient

Note 1 to entry: Trace amounts of e.g. grease or other lubricants that are introduced into the fuel processing stream as part of normal mill operations are not considered as additives.

3.2
biofuel pellet
densified biofuel made with or without *additives* (3.1) usually with a cylindrical form, random length typically 5 mm to 40 mm and diameter up to 25 mm and broken ends, produced by compressing biomass

Note 1 to entry: Usually the biomass has been milled before densification.

Note 2 to entry: See also non-woody pellet, wood pellet and pellet from thermally treated biomass

3.3
chemical treatment
any treatment with chemicals other than air, water or heat

EXAMPLE Glue and paint.

Note 1 to entry: Examples of chemical treatment are listed in ISO 17225-1.

3.4
coarse pellet fines
CPF
particles with a size ranging from ≥ 3,15 mm to < 5,6 mm resulting from breakage of pellets during production or handling

2) under preparation

3.5
commercial application
facility that utilises solid biofuel burning appliances or equipment that have similar fuel requirements as residential appliances

Note 1 to entry: Commercial applications should not be confused with industrial applications, which can utilize a much wider array of materials and have vastly different fuel requirements.

3.6
fines
F
fraction of small sized particles as defined by a specification or end-user

Note 1 to entry: Note to entry: In the solid biofuels standards fines are always defined as particles passing through a 3,15 mm round hole sieve

3.7
woody biomass
biomass originating from trees, bushes and shrubs together with their fruit, leaves and needles inherent to the biomass

Note 1 to entry: Note to entry: This definition includes forest, plantation and other virgin wood, wood processing industry by-products and residues, and used wood.

3.8
wood pellet
biofuel pellet (3.2) made from *woody biomass* (3.7)

4 Symbols and abbreviated terms

The symbols and abbreviated terms used in this part of ISO 17225 conform with the SI system of units as far as possible.

A	Designation for ash content on dry basis, A_d [% in mass]
ar	as received
BD	Designation for bulk density as received [kg/m^3, (loose volume)]
CPF	Designation for coarse pellet fines as received [% in mass, particles ≥ 3,15 mm and < 5,6 mm]
D	Designation for diameter as received, D [mm]
d	dry (dry basis)
DE	Designation for particle density as received [g/cm^3]
DT	Designation for flow temperature of the fuel ash [°C]
DU	Designation for mechanical durability as received [% in mass]
F	Designation for amount of fines (< 3,15 mm) as received [% in mass]
FT	Designation for flow temperature of the fuel ash [°C]
HT	Designation for hemisphere temperature of the fuel ash [°C]
L	Designation for length as received, L [mm]