INTERNATIONAL STANDARD

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Solid biofuels — Fuel specifications and classes —

Part 7: Graded non-woody briquettes

Biocombustibles solides — Classes et spécifications des combustibles —

Partie 7: Classes de briquettes d'origine agricole

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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).

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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 17225-7:2014), which has been technically revised. The main changes compared to the previous edition are as follows:

— Figure 1 changed;

— Class A is split into two classes, A1 and A2;

— Chlorine value changed in Class A2;

— Arsenic value changed in Class B;

— Ash melting behaviour added as an informative property.

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.

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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 biofuels; to enable good understanding between seller and buyer as well as a tool for communication with equipment manufacturers. It will also facilitate authority permission procedures and reporting.

This document supports the use of graded non-woody briquettes in specially designed appliances for residential, small commercial and public building applications and industrial use.

The residential, small commercial and public building appliances 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.

Non-woody briquettes have high ash, chlorine (Cl), nitrogen (N), sulfur (S) and major element contents, so non-woody briquettes are recommended to be used in appliances, which are specially designed or adjusted for this kind of briquettes.

In general, non-woody biomass materials have higher content of ash forming elements and produces ashes with lower melting temperature compared to most woody biomass. Be aware that different growing and soil conditions of the herbaceous or fruit biomass may influence the fuel ash composition differently depending on growth and soil conditions This may result in fouling, slagging and corrosion inside boilers. These problems are especially related to materials that have high content of potassium (K) and silicate (Si) and low content of calcium (Ca). The content of chlorine (Cl), phosphorous (P) and potassium (K) in the material may form chlorides and phosphates and other chemical compounds resulting in high hydrochloric emissions and chemically active ash causing corrosion. Special attention should be paid to the risk of corrosion in small and medium scale boilers and flue gas systems. Blending with woody biomass can improve the combustion characteristics.

NOTE 1 Briquettes produced according to this document can be used in stoves, fireplaces, cookers, roomheaters and multifired sauna stoves, which are tested according to European standards EN 13229,[1] EN 12815,[2] EN 12809,[3] EN 13240,[4] EN 15250[5] and EN 15821,[6] and boilers systems tested according to EN 303–5[7].

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

Although this document may be obtained separately, it requires 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 this document.

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Solid biofuels — Fuel specifications and classes —

Part 7: Graded non-woody briquettes

1 Scope

This document determines the fuel quality classes and specifications of graded non-woody briquettes. This document covers only non-woody briquettes produced from the following raw materials (see ISO 17225-1:2021, Table 1):

— 2 Herbaceous biomass

— 3 Fruit biomass

— 4 Aquatic biomass

— 5 Biomass blends and mixtures

NOTE 1 Herbaceous biomass originates from plants that have a non-woody stem and which die back at the end of the growing season. It includes grains or seeds crops from food production or processing industry and their by-products such as cereals.

NOTE 2 Blends and mixtures include blends and mixtures from the main origin-based solid biofuel groups woody biomass, herbaceous biomass, fruit biomass and aquatic biomass.

Blends are intentionally mixed biofuels, whereas mixtures are unintentionally mixed biofuels. The origin of the blend and mixture is to be described using ISO 17225-1:2021, Table 1.

If solid biofuel blend or mixture contains chemically treated material it shall be stated.

NOTE 3 Thermally treated biomass briquettes (e.g. torrefied briquettes) are not included in the scope of this document.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 17225-1:2021, *Solid biofuels — Part 1 — General requirements*

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

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

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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 18847, *Solid biofuels — Determination of particle density of pellets and briquettes*

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

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 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 briquette
densified biofuel made with or without additives in pre-determined geometric form with at least two dimensions of more than 25 mm, produced by compressing 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
commercial application
facility that utilizes 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.

3.5
non-woody biomass
biomass originating from herbaceous, fruit or aquatic biomass as well as blends or mixtures of woody and non-woody biomass

3.6
non-woody briquette
biofuel briquette (3.2) made from non-*woody biomass* (3.5)

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