INTERNATIONAL STANDARD

ISO 17225-4

Second edition
2021-02

Solid biofuels — Fuel specifications and classes —

Part 4: Graded wood chips

Biocombustibles solides — Classes et spécifications des combustibles —

Partie 4: Classes de plaquettes de bois

Reference number
ISO 17225-4:2021(E)

© ISO 2021



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Symbols and abbreviated terms **2**
5 Specification of graded wood chips **3**
Annex A (informative) **General guidelines for bulk density of graded wood chips** **7**
Bibliography **8**

© ISO 2021 – All rights reserved

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 TC238, *Solid biofuels*.

This second edition cancels and replaces the first edition (ISO 17225-4:2014), which has been technically revised. The main changes compared to the previous edition are as follows:

— particle size distribution classification updated;

— moisture and ash content classes updated;

— Annex A updated.

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.

© ISO 2021 – All rights reserved

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 [2].

This document supports the use of graded wood chips for small and medium residential, commercial and public building applications.

Depending on the type of energy conversion technology used (boilers, heaters, gasifiers, etc., the tolerances for a particular quality of wood chips will be different.

Scales of applications and their typical operation range:

- below 100 kW (Residential);
- from 75 to 500 kW (Small; e.g. residential, public and commercial buildings);
- from 500 kW to 1,5 MW (Medium; public and commercial buildings);
- 1,5 MW to 5 MW (Large; small industrial facilities and district heating);
- over 5 MW (Industrial; recommended to use 'ISO 17225-1 or ISO/DIS 17225-9[1)])

The scale used for grouping the applications utilizing wood chips is for illustration only and in practice, some overlaps between the applications and the scales are expected.

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

- Small-scale equipment usually does not 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 Wood chips produced according to this document can be used in boilers tested according to EN 303–5[1].

NOTE 2 For individual contracts and industrial use, ISO 17225-1 or ISO/DIS 17225-9 can be used.

Although this document can 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.

1) Under preparation. Stage at the time of publication: ISO/DIS 17225-9:2021.

© ISO 2021 – All rights reserved

Solid biofuels — Fuel specifications and classes —

Part 4: Graded wood chips

1 Scope

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

This document covers only wood chips, which are produced with sharp tools, and does not cover hog fuel, which is produced with blunt tools.

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

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

ISO 18135, *Solid Biofuels — Sampling*

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 2021 – All rights reserved

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

EXAMPLE Glue, paint, laminate.

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

3.2
contamination
occurrence of any undesirable matter such as chemical, physical and/or microbiological matter in the product

3.3
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.

[SOURCE: ISO 17225-1 2021, 3.2]

4 Symbols and abbreviated terms

The symbols and abbreviated terms used in this document 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)]

d dry (dry basis)

F Designation for amount of fines (< 3,15 mm) as determined [% in mass]

L Designation for length as received, *L* [mm]

M Designation for moisture content as received, M_{ar} [% in mass]

P Designation for particle size distribution as determined

q Designation for net calorific value as received, $q_{p,net,ar}$ [MJ/kg or kWh/kg] at constant pressure

NOTE 1 1 MJ/kg equals 1 GJ/t or 0,2 778 kWh/kg (1 kWh/kg equals 1 MWh/t and 1 MWh/t is 3,6 MJ/kg). 1 g/cm^3 equals 1 kg/dm^3. 1 mg/kg equals 0,000 1 %.

NOTE 2 Designation symbols are used in combination with a number to specify property levels in Table 1. For designation of chemical properties, chemical symbols like S (sulfur), Cl (chlorine), N (nitrogen) are used and the property class is added at the end of the symbol.

© ISO 2021 – All rights reserved