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## Solid biofuels — Particle size distribution of disintegrated pellets

*Biocombustibles solides — Détermination de la distribution granulométrique des granulés désintégrés*

ICS: 75.160.40; 27.190

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## ISO/DIS 17830:2022(E)

### 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](http://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](http://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](http://www.iso.org/iso/foreword.html).

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

This second edition cancels and replaces the first edition (ISO 17830:2015), which has been technically revised. The main changes are as follows:

- a) The set of suggested sieves was modified to better reflect industry practice and to be consistent with ISO 17827-2.
- b) A specific table for the results of size distribution analysis for quality control of pellets for industrial use was added. The order of sieves was reversed to align with other standards.
- c) A figure was added to show the sample division.
- d) Details were added to clarify the procedure and to improve the accuracy.
- e) The normative references were updated and amended.
- f) Editorial changes were made.

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](http://www.iso.org/members.html).

## Introduction

In power plants with powder fuel burners for energy production, the operators need information about the particle size distribution of the fuel for optimising particle burnout during combustion. Fuel preparation equipment, such as pulverizers, are used for crushing pellets into the original particle sizes before the material was pressed into pellets. The method described in this International Standard is intended to characterize particle size distribution of the material contained within fuel pellets and also allows for a relative comparison of pellets of different manufacturing.

This method is based on experience with pellets made from sawdust, wood shavings and milled wood, as well as straw. The method may also be applicable for pellets produced from other solid biofuel materials provided that they can be disintegrated into its constituents in water.

Pellets that are engineered to resist water, e.g. pellets from materials which have undergone some thermal treatments, cannot be characterised by this method.

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# Solid biofuels — Particle size distribution of disintegrated pellets

## 1 Scope

This International Standard aims to define the requirements and method used to determine particle size distribution of disintegrated pellets. It is applicable for pellets that fully disintegrate in hot water.

## 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 16559, *Solid biofuels — Vocabulary*

ISO 17827-2, *Solid biofuels — Determination of particle size distribution for uncompressed fuels — Part 2: Vibrating screen using sieves for classification of samples with apertures of 3,15 mm and below*

ISO 18134-1, *Solid biofuels — Determination of moisture content — Part 1: 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 21945, *Solid biofuels — Simplified sampling method for small scale applications*

ISO 14780, *Solid biofuels — Sample preparation*

## 3 Terms and definitions

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

ISO maintains terminology databases for use in standardization at the following addresses:

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

### 3.1

#### sieve fraction

mass fraction of test portion or sub-portion collected on a sieve after particle separation through the sieving process.

## 4 Principle

The particle size distribution is determined after the sample pellets have been disintegrated in hot deionised water and dried in a drying cabinet or oven. The determination is performed by sieving the dried material in accordance with ISO 17827-2.

## 5 Reagents

Deionised water.

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### 6 Apparatus

#### 6.1 Disintegration container

Disintegration container, waterproof container made of material such as stainless steel capable of withstanding a temperature of 100 °C. The container shall have a minimum volume of 5 l in order that 2 l of deionised water and the entire test portion can be accommodated without spilling over during stirring.

A rigid lid should be used to cover the container to minimize evaporation, contamination and cooling during the disintegration of the pellets in water.

#### 6.2 Electric kettle or other suitable equipment for water heating

Electric kettle or other suitable equipment for water heating, capable of heating at least 2 l of water.

#### 6.3 Drying cabinet or oven

Drying cabinet or oven, shall be capable of maintaining a temperature of  $(60 \pm 5)$  °C with at least three air exchanges per hour. The air velocity shall be such that the test sample particles are not dislodged from the drying container(s).

NOTE Higher air exchange rates will shorten the drying time.

#### 6.4 Drying containers

Drying containers, shall consist of non-corrodible heat-resistant material such as metal, glass or porcelain and be able to hold sufficient volume to accommodate the slurry from the disintegration container.

#### 6.5 Balance.

Balance, shall be capable of reading to the nearest 0,01 g.

#### 6.6 Sieves

Sieves, set of sieves described in ISO 17827-2 and listed in [Table 2](#) shall be considered the default sieve set. However, other sieve sets can be used based on the specific requirements as agreed upon by the interested parties.

#### 6.7 Weighing containers

Weighing containers, an adequate number of weighing containers are required.

The weighing of the sieved particle fractions can be performed either by weighing the remaining material directly on the tared weighed sieves or by collecting and weighing the material in weighing containers.

#### 6.8 Spoon

Spoon, shall be made of non-corrodible material for stirring the disintegration slurry.

#### 6.9 Mechanical sieving equipment

Mechanical sieving equipment, sieving equipment in accordance with ISO 17827-2 shall be used for determination of the particle size distribution of the disintegrated pellets and to break down agglomerates of particles formed during the drying of the slurry.