

BS EN ISO 17829:2015



BSI Standards Publication

Solid biofuels — Determination of length and diameter of pellets

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National foreword

This British Standard is the UK implementation of EN ISO 17829:2015. It supersedes BS EN 16127:2012 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/17, Solid biofuels.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2015

ISBN 978 0 580 81422 8

ICS 27.190; 75.160.10

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2015.

Amendments/corrigenda issued since publication

Date	Text affected
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EUROPEAN STANDARD

EN ISO 17829

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2015

ICS 27.190; 75.160.10

Supersedes EN 16127:2012

English Version

Solid biofuels - Determination of length and diameter of pellets (ISO 17829:2015)

Biocombustibles solides - Détermination de la longueur et du diamètre des granulés (ISO 17829:2015)

Biogene Festbrennstoffe - Bestimmung der Länge und des Durchmessers von Pellets (ISO 17829:2015)

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European foreword

This document (EN ISO 17829:2015) has been prepared by Technical Committee ISO/TC 238 "Solid biofuels" in collaboration with Technical Committee CEN/TC 335 "Solid biofuels" the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

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Endorsement notice

The text of ISO 17829:2015 has been approved by CEN as EN ISO 17829:2015 without any modification.

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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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 238, *Solid biofuels*.

Introduction

Pellets with a length and diameter outside the specification can cause problems with transportation in screw conveyors, silo outlets, and burner feeding systems. ISO 17225-1, ISO 17225-2, ISO 17225-6, and ISO 17225-8 stipulate dimensions of pellets. This International Standard describes procedures for determination the diameter classification according to ISO 17225-2 as well as the length and diameter of pellets.

Solid Biofuels — Determination of length and diameter of pellets

1 Scope

This International Standard specifies the methods for the determination of diameter and length of pellets. Concerning the pellet length methods for both determination of the proportion of oversized pellets and for determination of the average length are included.

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

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

ISO 17225-2, *Solid biofuels — Fuel specifications and classes — Part 2: Graded wood pellets*

ISO 17225-6, *Solid biofuels — Fuel specifications and classes — Part 6: Graded non-woody pellets*

ISO 17225-8¹⁾, *Solid biofuels — Fuel specifications and classes — Part 8: Thermally treated and densified biomass fuels*

EN 14778:2011, *Solid biofuels — Sampling*

EN 14780:2011, *Solid biofuels — Sample preparation*

ISO 18846²⁾, *Solid Biofuels — Determination of fines content in quantities of pellets*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

3 Terms and definitions

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

3.1

test sample

original sample sent to the laboratory for analysis

3.2

test portion

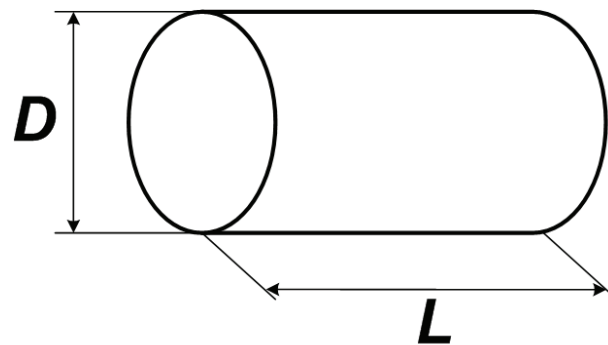
sample extracted from the test sample and used during the analysis

4 Principle

The length and diameter of fuel pellets of a representative test sample shall be measured by means of a caliper. The length of a pellet shall be measured along the axis of the cylinder. The diameter shall be measured perpendicular to the axis (see [Figures 1](#) and [2](#)).

1) In preparation.

2) To be published.



Key

D diameter of a pellet

L length of a pellet

Figure 1 — Length and diameter of a pellet

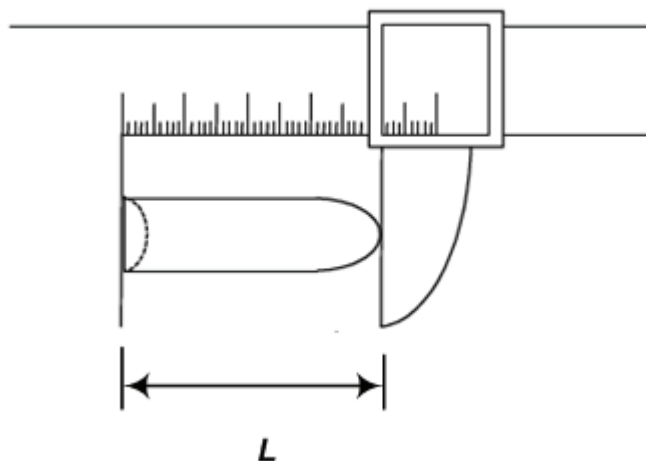


Figure 2 — Measuring the length between the mid-point of the convex and concave cross section of a pellet by means of a caliper.

5 Apparatus

5.1 **Measuring caliper**, shall have a resolution of at least 0,1 mm for measuring length and diameter.

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

5.3 **Sieve**, shall have round holes of a diameter at 3,15 mm in accordance with ISO 3310-2.

6 Sample preparation

The test sample for determination of length and diameter shall be obtained in accordance with EN 14778 and a test portion shall be extracted in accordance with EN 14780. The test sample shall be divided into two test portions, one consisting of 10 pellets and the other consisting of a minimum mass in accordance with [Table 1](#). The pellets shall be randomly selected.

Table 1 — Test portion size

Pellet size class	Estimated minimum test portion
≤6 mm	30 g - 40 g
>8 mm	40 g - 50 g
>10 mm	50 g - 70 g
>12 mm	70 g - 120 g
>25 mm	0 g - 500 g (minimum 50 pellets)

Both test portions shall be sieved in accordance with ISO 18846 using a sieve with punched round holes 3,15 mm in diameter in accordance with ISO 3310-2.

NOTE Rough handling during sample reduction and sieving could alter the surface of the pellets and thereby influence the result.

7 Procedure

7.1 Determination of pellet diameter class

In order to determine the diameter class for the test portion with 10 pellets, the diameter of each pellet shall be measured by means of a caliper (see 5.1). Record the result of each measurement. The average of the diameter measurements closest to the class defined in ISO 17225-2 determines the pellet diameter class.

7.2 Measuring of individual pellet length

Measure the length in mm of each pellet in the test portion with 40 - 50 pellets (see Clause 6) by means of a caliper (see 5.1). Record the result of each measurement.

7.3 Determination share of oversize length of pellets

7.3.1 Weighing

Determine the mass of the sieved test portion with 40 - 50 pellets by weighing to the nearest 0,01 g.

7.3.2 Sorting by length

Separate all pellets in the test portion with 40 - 50 pellets by means of a caliper (see 5.1) all pellets longer than the maximum length specified by ISO 17225-1, ISO 17225-2, ISO 17225-6, and ISO 17225-8.

NOTE Depending on the quality requirements, there can be more than one pellet length to be considered when sorting. Example: Concerning a D08 wood pellet, ISO 17225-2, Table 1 specifies $3,15 \text{ mm} \leq L \leq 40 \text{ mm}$. Comment c in ISO 17225-2, Table 1 states:

“Amount of pellets longer than 40 mm can be 1 w-%. Maximum length shall be <45 mm. Pellets are longer than 3,15 mm, if they stay on a round-hole sieve of 3,15 mm. (For the) amount of pellets shorter than 10 mm, (the) w-% (is) recommended to be stated”.

7.3.3 Weighing of fractions by length

Weigh the mass of the pellets separated in 7.3.2 to the nearest 0,01 g and record the result.

8 Calculation

8.1 Pellet diameter class

Calculate the mean value and the standard deviation of the recorded pellets diameters class as determined in [7.1](#) and express the results to the nearest 0,1 mm.

In case the test portion contains pellets of different diameter classes (e.g. a mixture of D06 and D08), the average and the standard deviation of the pellet diameter for each of the classes shall be calculated separately and reported as a percent share of the number of measured pellets.

8.2 Share of oversize pellets

Calculate the w-% of oversize pellets by dividing the weight of the oversize pellets by length as established in [7.3.3](#) by the weight of the test portion as established in [7.3.1](#) and multiply by 100. Report the number of pellets above maximum dimension by length as specified in ISO 17225-1, ISO 17225-2, ISO 17225-6 or ISO 17225-8.

8.3 Average pellet length

Calculate the mean value and the standard deviation of the recorded pellet lengths as determined in [7.2](#) and express the result to the nearest 0,1 mm.

9 Performance characteristics

Because of the varying nature of the pellets covered by this document it is not possible to give a precision statement (repeatability or reproducibility) for this test method.

10 Test report

The test report shall include at least the following information:

- a) identification of the laboratory performing the test and the date of the test;
- b) identification of the product (sample) tested;
- c) a reference to this International Standard, i.e. ISO 17829;
- d) mean value and standard deviation of the pellet length as per [8.3](#);
- e) mean value and standard deviation of the diameter for each of the class(es) (see [7.1](#)) and each class reported in percentage share of the total number of measured pellets
- f) w-% of pellets longer than 40 mm as specified in ISO 17225-1, ISO 17225-2, ISO 17225-6 and ISO 17225-8 (see [7.3.2](#));
- g) number of pellets longer than the maximum length specified in ISO 17225-1, ISO 17225-2, ISO 17225-6 and ISO 17225-8 (see [7.3.2](#));
- h) any unusual features noted during the determination, which may affect the result;
- i) any operation not included in this International Standard, or regarded as optional.

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