

---

---

**Solid biofuels — Determination of  
fines content in pellets**

*Biocombustibles solides — Détermination de la teneur en fines des  
granulés*



This document is a preview generated by ELS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2023

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](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Principle</b>	<b>1</b>
<b>5 Apparatus</b>	<b>2</b>
<b>6 Sample preparation</b>	<b>3</b>
6.1 Sample size reduction	3
6.2 Size of the test portion	3
<b>7 Procedure</b>	<b>4</b>
7.1 Preparing of the sieving equipment	4
7.2 Sieving	4
<b>8 Calculations</b>	<b>5</b>
8.1 Proportion of fines	5
8.2 Quality control	5
<b>9 Performance characteristics</b>	<b>5</b>
<b>10 Test report</b>	<b>5</b>
<b>Annex A (informative) Determination of coarse pellet fines (CPF)</b>	<b>6</b>
<b>Annex B (informative) Determination of fractions of fines smaller than 3,15 mm</b>	<b>11</b>
<b>Annex C (informative) Performance data</b>	<b>13</b>
<b>Annex D (informative) Research study data</b>	<b>15</b>
<b>Bibliography</b>	<b>18</b>

## 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 ISO/TC 238, *Solid biofuels*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 335, *Solid biofuels*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

This document specifies a method for manual determination of the fines content in pellets. The fines content is defined as the percentage in mass of material below 3,15 mm in size (measured with a round hole perforated metal plate sieve according to ISO 3310-2). The fines content is an important parameter since excessive amounts of fines in consignments of pellets can cause problems either in transportation systems or during combustion, or both. It also can cause health problems if the dust is inhaled and it increases the risk of dust explosions. Many of these problems are connected to the tendency of stratification of fines caused by any movement of the pellets.

[Annex A](#) describes a procedure for determining the amount of coarse pellet fines ( $3,15 \text{ mm} \leq \text{CPF} < 5,6 \text{ mm}$ ). The determination of the amounts of smaller fines particles, for example the fractions  $< 1 \text{ mm}$  and  $< 0,5 \text{ mm}$ , is given in [Annex B](#).

NOTE 1 The upper limit of 5,6 mm for CPF was chosen because a sieve with an aperture diameter of 5,6 mm is the standard commercial sieve with the next-smallest aperture diameter after 6 mm, which corresponds to the diameter of the standard pellet size. When conducting the procedure for CPF as outlined in [Annex A](#), additional CPF are created as a result of the sieving procedure. Test results are therefore indicative and best used for comparative purposes rather than treated as CPF originally present in the sample.

NOTE 2 This document will replace ISO 18846.



# Solid biofuels — Determination of fines content in pellets

## 1 Scope

This document specifies a method for determining the amount of material passing through a sieve with 3,15-mm-diameter round holes. It is intended for use in all applications (e.g. laboratories, production sites, field locations) where the measurement of fines is required.

## 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 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

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

ISO 16559, *Solid biofuels — Vocabulary*

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### coarse pellet fines

##### CPF

particles with a size ranging from  $\geq 3,15$  mm to  $< 5,6$  mm resulting from breakage of pellets during production or handling

Note 1 to entry: The fraction of CPF contains all particles which pass through a sieve with 5,6-mm-diameter round holes and which are retained on a sieve with 3,15-mm-diameter round holes (see ISO 3310-2).

## 4 Principle

A test portion is subjected to manual screening by means of a sieve with 3,15-mm-diameter round holes while utilizing specific test conditions (e.g. a template is used to guide the movement of the sieve, rotational speed is specified, the number of rotations is dependent on the nature of the material being tested) and the mass of the material passing through the sieve is determined as a mass percentage of the total mass of the test portion.