
**Solid recovered fuels — Determination
of moisture content using the oven dry
method —**

**Part 3:
Moisture in general analysis sample**

iTeh Standard
Combustibles solides de récupération — Détermination de l'humidité
par la méthode de séchage à l'étuve —
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Foreword

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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).

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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 300, *Solid recovered fuels*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 343, *Solid recovered fuels*, 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.

Solid recovered fuels — Determination of moisture content using the oven dry method —

Part 3: Moisture in general analysis sample

1 Scope

This document specifies a method for the determination of moisture in a general analysis sample by drying the sample in an oven. This method is suitable for use for general analysis samples in accordance with CEN/TS 15414-1^{[3]1}. It is applicable to all solid recovered fuels.

If solid recovered fuels contain large amounts of oil-fractions the Karl-Fischer-Method (for example ISO 760) is advisable. Otherwise, a lower temperature is recommended (e.g. $50\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$) and a longer drying time until constant mass is achieved.

NOTE The term moisture content, when used with recovered materials, can be misleading since solid recovered materials, e. g. biomass, frequently contain varying amounts of volatile compounds (extractives) which can evaporate when determining the moisture content of the general analyses sample by oven drying.

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 21637, *Solid recovered fuels — Vocabulary*

<https://standards.iteh.ai/catalog/standards/iso/227ce373-60f1-440b-b17a-0ecee429fbf7/iso-21660-3-2021>

ISO 21646²⁾, *Solid recovered fuels — Sample preparation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21637 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/>

4 Principle

The analysis sample of solid recovered fuels is dried at a temperature of $105\text{ }^{\circ}\text{C}$ under air atmosphere or nitrogen atmosphere. The percentage of moisture is calculated from the loss in mass of the test sample. If the sample material is susceptible to oxidation (at $105\text{ }^{\circ}\text{C}$), drying in nitrogen atmosphere is performed.

1) The adoption of the standard series EN 15414 as standard series ISO 21660 is planned. ISO 21660-3 is published in parallel at CEN level as EN 21660-3.

2) Under preparation. Stage at the time of publication: ISO/DIS 21646:2021.

Automatic equipment (such as gravimetric analysers) may be used as long as the equipment is validated by parallel measurements to the reference method. The automatic equipment shall fulfil all the requirements regarding sample size, heating procedure, temperature, atmosphere and weighing accuracy. Deviations from this paragraph shall be reported and justified.

For information about environmental aspect see [Annex B](#).

5 Apparatus

5.1 Drying oven, capable of being controlled at $(105 \pm 2)^\circ\text{C}$ (refer to the manufacturer's manual) and in which the air atmosphere changes between three and five times per hour. The air velocity shall be such that the sample particles are not dislodged from their weighing dish ([5.2](#)).

5.2 Weighing dish, of glass or corrosion resistant and temperature resistant material, with a well-fitting lid and of such a size that the sample layer does not exceed $0,2 \text{ g/cm}^2$.

5.3 Balance, with a resolution of $0,1 \text{ mg}$.

5.4 Desiccator, with desiccant (e.g. silica gel) to avoid absorption of moisture from the atmosphere to the sample.

6 Sample preparation

The sample used for the determination shall be the general analysis test sample with a particle size $\leq 1 \text{ mm}$ prepared in accordance with ISO 21646.

Before commencing the determination, mix the analysis sample, preferably by mechanical means.

7 Procedure

[ISO 21660-3:2021](#)

A minimum of two determinations shall be carried out on the test sample.

Dry an empty weighing dish ([5.2](#)) with its lid at $(105 \pm 2)^\circ\text{C}$ until constant mass is reached and allow it to cool to room temperature in the desiccator ([5.4](#)).

NOTE 1 Several weighing dishes can be handled at the same time.

Weigh the weighing dish ([5.2](#)) with its lid to the nearest $0,1 \text{ mg}$.

Add minimum 1 g of the analysis sample into the weighing dish ([5.2](#)) in an even layer and weigh the weighing dish with its lid plus sample to the nearest $0,1 \text{ mg}$.

Heat the uncovered weighing dish ([5.2](#)) and its lid together with the sample at $(105 \pm 2)^\circ\text{C}$ until constant mass is reached. Constancy in mass is defined as a change not exceeding 1 mg in mass during a further period of 60 min of heating at $(105 \pm 2)^\circ\text{C}$. If the sample material is susceptible to oxidation at the given temperature use nitrogen atmosphere for drying. The drying atmosphere used has to be mentioned in the test report.

NOTE 2 The drying time needed is usually between 2 h to 3 h .

WARNING — For some materials present in solid recovered fuels there can be a risk of self-ignition when drying at 105°C .

While still in the drying oven ([5.1](#)), put the lid on the weighing dish ([5.2](#)). Transfer the weighing dish and its contents to the desiccator ([5.4](#)). Allow it to cool to room temperature.