



SLOVENSKI STANDARD
oSIST prEN ISO 18123:2022
01-september-2022

Trdna biogoriva - Določevanje vsebnosti hlapnih snovi (ISO/DIS 18123:2022)

Solid biofuels - Determination of volatile matter (ISO/DIS 18123:2022)

Biogene Festbrennstoffe – Bestimmung des Gehaltes an flüchtigen Bestandteilen (ISO/DIS 18123:2022)

Biocombustibles solides - Détermination des matières volatiles (ISO/DIS 18123:2022)

Ta slovenski standard je istoveten z: prEN ISO 18123

ICS:

75.160.40 Biogoriva Biofuels

oSIST prEN ISO 18123:2022 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 18123

ISO/TC 238

Secretariat: SIS

Voting begins on:
2022-06-14

Voting terminates on:
2022-09-06

Solid biofuels — Determination of volatile matter

ICS: 27.190; 75.160.40

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Published in Switzerland

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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 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 238, *Solid biofuels*.

This second edition cancels and replaces the first edition (ISO 18123:2014), which has been technically revised.

The main changes are as follows:

- “ISO 21945, Solid biofuels – Simplified sampling method for small scale applications” has been added to the list of Normative References
- The Standard specifies that the entire procedure shall be done in duplicate
- EN Standards have been replaced by ISO Standards
- Minor editorial corrections

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.

Introduction

The volatile matter is determined as the loss in mass, less that due to moisture, when a solid biofuel is heated out of contact with air under standardised conditions. The test is empirical and, in order to ensure reproducible results, it is essential that the rate of heating, the final temperature, and the overall duration of the test are carefully controlled. It is also essential to exclude air from the solid biofuel during heating to prevent oxidation. The fit of the crucible lid is therefore critical. The moisture content of the general analysis sample is determined at the same time as the volatile matter so that the appropriate correction can be made.

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Solid biofuels — Determination of volatile matter

1 Scope

This International Standard aims to define the requirements and method used to determine the volatile matter of solid biofuels. It is intended for persons and organisations that manufacture, plan, sell, erect or use machinery, equipment, tools, and entire plants related to solid biofuels, and to all persons and organisations involved in producing, purchasing, selling, and utilizing solid biofuels.

The volatile matter is determined as the loss in mass, less that due to moisture, when solid biofuel is subject to partial pyrolysis under standardized conditions.

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 — Vocabulary*

ISO 18134-3, *Solid biofuels — Determination of moisture content — Oven dry method — Part 3: Moisture in general analysis sample*

ISO 18135, *Solid Biofuels — Sampling*

ISO 14780, *Solid biofuels — Sample preparation*

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 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/>

4 Principle

A portion of the general analysis sample is heated mostly out of contact with air at $900\text{ °C} \pm 10\text{ °C}$ for 7 min. The furnace is normally not equipped with a vacuum however there is a partial vacuum created during heating to a degree depending on air influx during charging of the test portion into the chamber and the air trapped in the crucible before the lid is put on. The percentage of volatile matter is calculated from the loss in mass of the test portion after deducting the loss in mass due to moisture.

Automatic equipment may be used when the method is validated with biomass reference samples of an adequate biomass type. The automatic equipment shall fulfil all the requirements given in [Clauses 5 to 8](#) regarding sample size, atmosphere, temperatures, and weighing accuracy.

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5 Apparatus

5.1 Furnace

The furnace shall be heated by electricity, in which a zone of uniform temperature of $900\text{ °C} \pm 10\text{ °C}$ can be maintained (see example in [Figure 1](#)).

NOTE It is important for furnaces to have flues so that the furnace door seals well. The flue should not reach far out of the oven and should be fitted with a butterfly valve to restrict airflow through the furnace.

Its heating capacity shall be such that, with an initial temperature of $900\text{ °C} \pm 10\text{ °C}$, the temperature is regained within 4 min after insertion of a cold stand and its crucibles. The temperature is measured with a thermocouple, as described in [5.2](#).

Normally the furnace will be designed specifically either for multiple determinations using a number of crucibles in one stand or for receiving one crucible and its stand.

The crucible stand shall be placed in the middle of the furnace. The temperature of 900 °C shall be attained as closely as possible with a specified tolerance of $\pm 10\text{ °C}$ in order to compensate for inherent errors in the temperature measurement and lack of uniformity in the temperature distribution.

Dimensions in millimetres

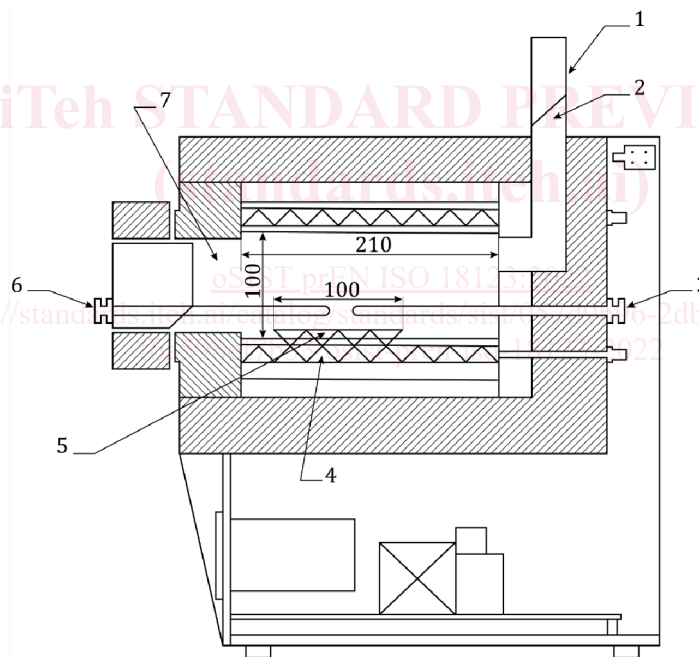


Figure 1 — Example of suitable furnace

Key

1	flue	5	zone of uniform temperature
2	valve	6	check thermocouple
3	thermocouple	7	chamber (width 700 mm)
4	heating system		

5.2 Thermocouples and temperature calibration

A sheathed thermocouple shall be permanently installed in the furnace (see right hand side of [Figure 1](#)) with its thermo junction as close as possible to the centre of the heating chamber.