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Solid biofuels — Determination of ash content

Biocombustibles solides — Détermination de la teneur en cendres

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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*, 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).

This second edition cancels and replaces the first edition (ISO 18122:2015), which has been technically revised.

The main changes are as follows:

— more detailed descriptions of the ashing furnace and ashing procedure;

— repeatability and reproducibility performance data updated;

— several references updated;

— 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.

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Introduction

Ash content is an important parameter for fuel deliveries since ash is a by-product of combustion and ends up as bottom ash or fly-ash and needs to be removed. Depending on the jurisdiction, ash may be deposited or used for production of other products or as fertilizer. Knowing how much ash comes with a fuel can have economic consequences. Since the chemical composition of ash contributes to slagging and corrosion in the combustion equipment, it is therefore important to know the amount of ash contained in a fuel. Other testing standards are used for determining the chemical composition of ash.

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Solid biofuels — Determination of ash content

1 Scope

This document specifies a method for the determination of ash content of all solid biofuels.

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 14780, *Solid biofuels — Sample preparation*

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 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

The ash content is determined by calculating the mass of the residue remaining after the sample is heated in air under rigidly controlled conditions of time, sample weight and equipment specifications to a controlled final temperature. The final temperature of 550 ± 10 °C is considered standard; however, other final temperatures may be used provided all other furnace conditions (e.g. air flows, temperature ramp rates, hold times) remain the same and the alternative final temperature is clearly referenced on the test report. Alternative final temperatures referenced in other test methods include 710 °C and 815 °C. The repeatability and reproducibility limits provided in Clause 9 are not applicable to alternative final temperatures.

Automatic equipment (such as gravimetric analysers) 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 Clause 7 regarding sample size, heating procedure, atmosphere, temperature and weighing accuracy.

NOTE The difference in the ash content if determined at a higher temperature, 815 °C, according to Reference [1], rather than 550 °C, is explained by the decomposition of carbonates forming CO_2, by losses of volatile inorganic compounds and further oxidation of inorganic compounds (to higher oxidation states).

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