Soil, waste, treated biowaste and sludge - Determination of total organic carbon (TOC) by dry combustion

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15936:2022 sisaldab Euroopa standardi EN 15936:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 15936:2022 consists of the English text of the European standard EN 15936:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.02.2022.	Date of Availability of the European standard is 23.02.2022.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.030.01, 13.080.10

EUROPEAN STANDARD

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English Version

Soil, waste, treated biowaste and sludge - Determination of total organic carbon (TOC) by dry combustion

Sols, déchets, biodéchets traités et boues - Dosage du carbone organique total (COT) par combustion sèche

Boden, Abfall, behandelter Bioabfall und Schlamm - Bestimmung des gesamten organischen Kohlenstoffs (TOC) mittels trockener Verbrennung

This European Standard was approved by CEN on 19 December 2021.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 15936:2022) has been prepared by Technical Committee CEN/TC 444 "Environmental characterization of solid matrices", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by August 2022, and conflicting national standards shall be withdrawn at the latest by month August 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15936:2012.

This document combines methods from EN 15936:2012 and EN 13137:2001.

The main changes compared to the previous edition are as follows:

— New composition of the substances in control mixture A (6.10) was defined and the recovery requirement (9.3) was adapted to the results of a lab trial;

— Annex C – "Determination of total organic carbon (TOC) in solid samples using the suspension method" was skipped;

— The text was editorially revised.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is applicable and validated for several types of matrices as indicated in Table 1 (see also Annex A for the results of the validation). The results in this document are expressed in % C in relation to the dry mass (dm).

Table 1 — Matrices for which this document is applicable and validated

Matrix	Materials used for validation
Sludge	Municipal sludge
Biowaste	Compost, Fresh Compost
Soil	Sludge amended soil, Agricultural soil
Waste	Filter cake, Bottom ash, Electro-plating sludge, Dredged sludge, Rubble

WARNING — Persons using this document should be familiar with usual laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

IMPORTANT — It is absolutely essential that tests conducted according to this document be carried out by suitably trained staff.

1 Scope

This document specifies two methods for the determination of total organic carbon (TOC) in sludge, treated biowaste, soil and waste samples containing more than 0,1 % carbon in relation to the dry mass (dm).

NOTE This method can also be applied to other environmental solid matrices, provided the user has verified the applicability.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 https://www.electropedia.org/

3.1
total carbon
TC
quantity of carbon present in the sample in the form of organic, inorganic and elemental carbon

3.2
total inorganic carbon
TIC
quantity of carbon that is liberated as carbon dioxide by acid treatment

Note 1 to entry: Typically, the TIC represents the carbonates present in a sample.

3.3
total organic carbon
TOC
quantity of carbon that is converted into carbon dioxide by combustion and which is not liberated as carbon dioxide by acid treatment

4 Principle

4.1 Method A (indirect procedure)

In this procedure, the TOC is obtained by the difference between the results of the measurements of TC and TIC.

The total carbon (TC) present in the sample is converted into carbon dioxide by combustion in an oxygen-containing gas flow free of carbon dioxide. To ensure complete combustion, catalysts and/or modifiers can be used. The released amount of carbon dioxide is measured e.g. by infrared spectrometry, thermal conductivity detection, or other suitable techniques.

The TIC is determined separately from another sub-sample by means of acidification and purging of the released carbon dioxide. The carbon dioxide shall be measured by one of the techniques mentioned above.