

Characterization of waste - Determination of total organic carbon (TOC) in waste, sludges and sediments

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 13137:2001 sisaldab Euroopa standardi EN 13137:2001 ingliskeelset teksti.	This Estonian standard EVS-EN 13137:2001 consists of the English text of the European standard EN 13137:2001.
Käesolev dokument on jõustatud 19.10.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 19.10.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard specifies two methods for the determination of total organic carbon (TOC) in undried waste samples containing more than 1 g carbon per kg of dry matter (0.1 % w/w). When present, elemental carbon, carbides, cyanides, cyanates, isocyanates and thiocyanates are determined as organic carbon using the methods described in this standard. An interpretation of the measured value may therefore be problematical in cases where the waste contains relevant levels of the above mentioned components. If needed, these components shall be determined separately by means of a suitable validated procedure and be recorded in the test report.	Scope: This European Standard specifies two methods for the determination of total organic carbon (TOC) in undried waste samples containing more than 1 g carbon per kg of dry matter (0.1 % w/w). When present, elemental carbon, carbides, cyanides, cyanates, isocyanates and thiocyanates are determined as organic carbon using the methods described in this standard. An interpretation of the measured value may therefore be problematical in cases where the waste contains relevant levels of the above mentioned components. If needed, these components shall be determined separately by means of a suitable validated procedure and be recorded in the test report.
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ICS 13.030.10, 13.030.20

Võtmesõnad: chemical analysis and testin, isocyanates, methods, organic matters, properties, reagents, sediment, sewage treatment sludges, sludge, solutes, test equipment, testing, thiocyanates, tipping (waste), waste dumps, waste treatment, wastes, water practice

ICS 13.030.10, 13.030.20

English version

**Characterization of waste - Determination of total organic carbon
(TOC) in waste, sludges and sediments**

Caractérisation des déchets - Dosage du carbone
organique total (COT) dans les déchets, boues et
sédiments

Charakterisierung von Abfall - Bestimmung des Gesamten
Organischen Kohlenstoffs (TOC) in Abfall, Schlämmen und
Sedimenten

This European Standard was approved by CEN on 18 June 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 292 "Characterization of waste", 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 February 2002, and conflicting national standards shall be withdrawn at the latest by February 2002.

Annex A of this European Standard is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Organic carbon in waste as well as in sludges and sediments is found in various forms. Due to the diversity of possible organic carbon compounds, the quantitative determination of all individual organic components of natural and anthropogenic origin is not possible. Therefore, it is necessary to rely on the measurement of total quantities. One of these is total organic carbon (TOC).

This parameter may be used for assessing the suitability of waste for landfilling.

1 Scope

This European Standard specifies two methods for the determination of total organic carbon (TOC) in undried waste samples containing more than 1 g carbon per kg of dry matter (0,1 %).

This standard can be applied as well to sludges, sediments and comparable materials.

When present, elemental carbon, carbides, cyanides, cyanates, isocyanates, isothiocyanates and thiocyanates are determined as organic carbon using the methods described in this standard. An interpretation of the measured value may therefore be problematical in cases where the waste contains relevant levels of the above mentioned components. If needed, these components shall be determined separately by means of a suitable validated procedure and be recorded in the test report.

NOTE At the time of publication of this European Standard a standardized procedure for determination of elemental carbon in waste is not available.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 3733, *Petroleum products and bituminous materials - Determination of water - Distillation method*.

ISO 8466-1, *Water quality - Calibration and evaluation of analytical methods and estimation of performance characteristics - Part 1: Statistical evaluation of the linear calibration function*.

ISO 6296, *Petroleum products - Determination of water – Potentiometric Karl Fischer titration method*.

ISO 11465, *Soil quality - Determination of dry matter and water content on a mass basis - Gravimetric method*.

EN 12880, *Characterization of sludges - Determination of dry residue and water content*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1

total carbon (TC)

the quantity of carbon present in waste in the form of organic, inorganic and elemental carbon

3.2

total inorganic carbon (TIC)

the quantity of carbon that is liberated as carbon dioxide by acid treatment

3.3

total organic carbon (TOC)

the quantity carbon that is converted into carbon dioxide by combustion and which is not liberated as carbon dioxide by acid treatment

NOTE Be aware that the above definitions are valid for this European Standard only and do not comply completely with scientific definitions of TC, TOC and TIC.

4 Principle

The TOC can be measured either by Method A (indirect procedure) or by Method B (direct procedure).

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 undried sample is converted to 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 by infrared spectrometry, gravimetry, coulometry, conductometry, thermal conductivity detection, flame ionization detection after reduction to methane, or other suitable techniques.