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STANDARDS Australia

Soil and waste characterization — Temperature dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})



AS ISO 17505:2026

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Environment Protection Authority Victoria
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This page explains the meaning of the language and structure of this Standard.

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Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Standards Australia Committee EV-009, Sampling and Analysis of Soil.

The objective of this document is to specify a method for the differentiated determination of the organic carbon content (TOC_{400}) which is released at temperatures up to 400 °C, the residual oxidizable carbon (ROC) (including e.g. lignite (brown coal), hard coal, charcoal, black carbon, soot) and the inorganic carbon (TIC_{900}) which is released at temperatures up to 900 °C.

The basis of this method is the dry combustion or decomposition of carbon to CO_2 in the presence of oxygen or non-oxygen conditions using temperatures ranging from 150 °C to 900 °C in dry solid samples of sediment, soil, soil with anthropogenic admixtures and solid waste with carbon contents of more than 1 g per kg.

This document is identical to, and has been reproduced from, ISO 17505:2025, *Soil and waste characterization — Temperature dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})*.

As this document has been reproduced from an international document, a comma is to be read as a full point when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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Contents

Page

Preface ..... **v**
Foreword ..... **vii**
Introduction ..... **viii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **2**
5 Interferences **3**
5.1 Interference due to carbides 3
5.2 Interference due to sulfur and nitrogen compounds 3
5.3 Interference due to carbonates 3
5.4 Peak not reaching the baseline 5
5.5 Difficulties in separating ROC_{600} peak and TIC_{900A} peak 6
5.6 Interferences due to premature releases and deflagrations 7
5.7 Interferences due to catalytic active substances in samples 7
6 Reagents **7**
6.1 General 7
6.2 Standards for system control 8
7 Apparatus **8**
8 Procedure **9**
8.1 General 9
8.2 Sample preparation and processing 9
8.3 Calibration 9
8.4 Measurement (oxidative method A) 9
8.5 Measurement (mixed oxidative/non-oxidative method B) 10
9 Evaluation **11**
9.1 General 11
9.2 Control measurements 13
10 Expression of results **13**
11 Test report **13**
Annex A (informative) **Performance characteristics** **14**
Annex B (informative) **Cooling procedure for method B** **21**
Bibliography **22**

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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 the European Committee for Standardization (CEN) (as EN 17505:2023) and was adopted, without modifications other than those given below, by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical and physical characterization* under the fast-track procedure.

— EN ISO 10693 references have been changed to ISO 10693;

— EN 15936 has been added to the Bibliography;

— cross references in 6.2 have been corrected.

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

Carbon occurs in soils and materials similar to soil in a variety of compounds and forms. When determining carbon in soils or soil-like materials, an overall determination of the different mass fractions is most feasible. The summarized declaration of carbon is yet done by differentiating organic and inorganic carbon (EN 15936, ISO 10694). In the proportion classified as “organic carbon”, a fraction of very stable highly aromatic and highly condensed carbon compounds can be present, sometimes in significant mass fractions. Since this black (pyrogenic) carbon is only very slowly decomposed and released, its environmental relevance has to be differently evaluated than the proportions of organic carbon which are faster chemical-biologically decomposed. The environmental relevance is estimated if e.g. the suitability of soils and soil-like materials for disposal in landfill is assessed. For a differentiated assessment, a separate declaration of the different mass fractions of organic, black (pyrogenic) and inorganic carbon is necessary. Using the specified temperature-gradient method and utilizing the combustion characteristic(s), the carbon fractions established according to this standard in soil and soil-like materials can be differentiated.

In respect of the hazard potential, the content of solely organically bonded carbon in solids determined with the described method can be important for disposal and/or recycling.

The method has been validated with the materials listed in Table 1, see also Annex A.

Table 1 — Materials used for validation

Material type	Materials used for validation
soils from natural material	mineral soils soil with anthropogenic admixtures (urban soils)
tailing material (tailings)	tailing material from coal mining
sediment	sediment
waste	waste incineration ash foundry sand construction waste

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Australian Standard®

Soil and waste characterization — Temperature dependent differentiation of total carbon (TOC_{400}, ROC, TIC_{900})

1 Scope

This document specifies a method for the differentiated determination of the organic carbon content (TOC_{400}) which is released at temperatures up to 400 °C, the residual oxidizable carbon (ROC) (including e.g. lignite (brown coal), hard coal, charcoal, black carbon, soot) and the inorganic carbon (TIC_{900}) which is released at temperatures up to 900 °C.

The basis of this method is the dry combustion or decomposition of carbon to CO_2 in the presence of oxygen or non-oxygen conditions using temperatures ranging from 150 °C to 900 °C in dry solid samples of sediment, soil, soil with anthropogenic admixtures and solid waste (see Table 1) with carbon contents of more than 1 g per kg (0,1 % C) (per carbon type in the test portion).

NOTE TIC_{900}, includes the TIC measured after acid addition e.g. by ISO 10694 or EN 15936. TOC_{400} is a fraction of TOC measured according to e.g. ISO 10694 or EN 15936.

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.

EN 16179, *Sludge, treated biowaste and soil — Guidance for sample pretreatment*

EN 15002, *Characterization of waste — Preparation of test portions from the laboratory sample*

ISO 11464, *Soil quality — Pretreatment of samples for physico-chemical analysis*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/

3.1
total organic carbon which is released up to 400 °C
TOC_{400}
quantity of carbon which is determined in the range between 150 °C – (400 ± 20) °C to the 1st signal minimum after the minimum holding time at (400 ± 20) °C, in the case of dry combustion in the presence of oxygen

Note 1 to entry: TOC_{400} is a fraction of TOC measured e.g. by ISO 10694 or EN 15936.

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