



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 17184:2014

# Soil quality - Determination of carbon and nitrogen by near-infrared spectrometry (NIRS) (ISO 17184:2014)

## I.S. EN ISO 17184:2014

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

EN ISO 17184:2014

*Published:*

2014-05-21

*This document was published under the authority of the NSAI and comes into effect on:*

2014-06-07

ICS number:

13.080.10

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

**EN ISO 17184**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

---

ICS 13.080.10

English Version

## Soil quality - Determination of carbon and nitrogen by near-infrared spectrometry (NIRS) (ISO 17184:2014)

Qualité du sol - Dosage du carbone et de l'azote par spectrométrie proche infrarouge (SPIR) (ISO 17184:2014)

Bodenbeschaffenheit - Bestimmung von Kohlenstoff und Stickstoff durch Nahinfrarotspektroskopie (NIRS) (ISO 17184:2014)

This European Standard was approved by CEN on 24 April 2014.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

<b>Contents</b>	<b>Page</b>
Foreword.....	<b>3</b>

## **Foreword**

This document (EN ISO 17184:2014) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 345 "Characterization of soils" 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 November 2014, and conflicting national standards shall be withdrawn at the latest by November 2014.

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

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

### **Endorsement notice**

The text of ISO 17184:2014 has been approved by CEN as EN ISO 17184:2014 without any modification.

This page is intentionally left blank

# INTERNATIONAL STANDARD

**ISO  
17184**

First edition  
2014-05-15

---

---

## **Soil quality — Determination of carbon and nitrogen by near-infrared spectrometry (NIRS)**

*Qualité du sol — Dosage du carbone et de l'azote par spectrométrie  
proche infrarouge (SPIR)*



Reference number  
ISO 17184:2014(E)

© ISO 2014

**ISO 17184:2014(E)**



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland



# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Principle</b> .....	<b>1</b>
<b>4 Apparatus</b> .....	<b>1</b>
<b>5 Procedure</b> .....	<b>2</b>
5.1 Preparation of samples.....	2
5.2 Instrument calibration.....	2
5.3 Sample measurement.....	4
<b>6 Test report</b> .....	<b>5</b>
<b>Annex A (informative) Precision data</b> .....	<b>6</b>
<b>Bibliography</b> .....	<b>9</b>

## ISO 17184:2014(E)

### 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

# Soil quality — Determination of carbon and nitrogen by near-infrared spectrometry (NIRS)

## 1 Scope

This International Standard specifies a method for the determination of carbon and nitrogen in soils by direct measurement of sample spectra in the near-infrared spectral region. The spectra are evaluated by a suitable calibration model derived from the results obtained by reference methods.

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

## 3 Principle

Soil samples are measured by reflectance near-infrared (NIR) spectroscopy. Diffuse reflectance NIR spectroscopy offers a non-destructive means for measurement of soil properties based on reflectance spectra of illuminated soils. Spectral data are evaluated by a suitable calibrating model derived from the measurement of a sufficient number of representative soil samples with known content of carbon and/or nitrogen determined by reference methods. Calibration equations reflect the relationship between the constituents of the sample and NIR spectral information. The soil samples and the set of calibrating samples for the NIR measurement are prepared the same way.

NOTE 1 NIR spectrometry is a very fast non-destructive and environmentally friendly analytical technique when compared to the standard chemical methods used as reference methods.

NOTE 2 Soils generally have similar reflectance spectra in the 1 100 nm to 2 500 nm range. The absorption peaks for soils in the near-infrared region are difficult to assign to specific chemical components.

## 4 Apparatus

**4.1 Near-infrared instrument**, based on measurement of reflectance spectra in the near-infrared region (wavelength range from 900 nm to 2 500 nm is usually applied). The instrument should be equipped with a suitable measurement cell for pulverized solid samples. The instrument should measure sufficiently large sample volume to eliminate any significant influence of inhomogeneity of the sample. The software shall allow instrument tests, calibration, sample measurement and data evaluation.

Resolution of the instrument should be equal to 8 nm or better.

NOTE Wavelengths of spectra recorded in higher resolution may be averaged to reduce spectra noise and there is a risk of over fitting of the calibration model. Instruments with lower resolution may be used if their performance is verified for intended purposes.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-