



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 11269-2:2013

Soil quality - Determination of the effects of pollutants on soil flora - Part 2: Effects of contaminated soil on the emergence and early growth of higher plants (ISO 11269-2:2012)

## I.S. EN ISO 11269-2:2013

*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:*

*This document is based on:*  
EN ISO 11269-2:2013

*Published:*  
5 March, 2013

This document was published under the authority of the NSAI and comes into effect on:  
5 March, 2013

**ICS number:**

13.080.30

**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

ICS 13.080.30

English Version

Soil quality - Determination of the effects of pollutants on soil  
flora - Part 2: Effects of contaminated soil on the emergence and  
early growth of higher plants (ISO 11269-2:2012)

Qualité du sol - Détermination des effets des polluants sur  
la flore du sol - Partie 2: Effets des sols contaminés sur  
l'émergence et la croissance des végétaux supérieurs (ISO  
11269-2:2012)

Bodenbeschaffenheit - Bestimmung der Wirkungen von  
Schadstoffen auf die Bodenflora - Teil 2: Wirkung von  
verunreinigten Böden auf Saataufgang und frühes  
Wachstum höherer Pflanzen (ISO 11269-2:2012)

This European Standard was approved by CEN on 5 February 2013.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

---

**Contents**

Page

**Foreword.....3**

## **Foreword**

The text of ISO 11269-2:2012 has been prepared by Technical Committee ISO/TC 190 “Soil quality” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 11269-2:2013 by 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 August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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 11269-2:2012 has been approved by CEN as EN ISO 11269-2:2013 without any modification.

*This page is intentionally left BLANK.*

I.S. EN ISO 11269-2:2013  
**INTERNATIONAL  
STANDARD**

**ISO  
11269-2**

Third edition  
2012-01-15

---

---

**Soil quality — Determination of the  
effects of pollutants on soil flora —**

**Part 2:  
Effects of contaminated soil on the  
emergence and early growth of higher  
plants**

*Qualité du sol — Détermination des effets des polluants sur la flore du  
sol —*

*Partie 2: Effets des sols contaminés sur l'émergence et la croissance  
des végétaux supérieurs*



Reference number  
ISO 11269-2:2012(E)

© ISO 2012



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing 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

Foreword .....	iv
Introduction .....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Units .....	3
5 Principle .....	3
6 Test plants .....	3
7 Materials .....	4
7.1 Test vessels .....	4
7.2 Soil .....	4
8 Equipment .....	6
9 Reference substance .....	6
10 Procedure .....	6
10.1 Experimental design .....	6
10.2 Preparation of the pots .....	7
10.3 Preparation of the seeds .....	7
10.4 Growth conditions .....	8
10.5 Start of the test .....	8
10.6 Handling during the test .....	8
11 Validity criteria .....	9
12 Assessment of the results .....	9
12.1 Data presentation .....	9
12.2 Expression of the results .....	9
13 Statistical analysis .....	9
13.1 General .....	9
13.2 Range-finding test .....	10
13.3 Final test .....	10
14 Test report .....	11
<b>Annex A (informative) Additional recommended plant species based on test results gained by applying Environment Canada Test Method: EPS 1/RM/45<sup>[4]</sup> .....</b>	<b>13</b>
<b>Annex B (informative) Phytotoxic values for reference compounds: sodium trichloro-acetate and boric acid .....</b>	<b>15</b>
<b>Annex C (informative) Recommended method for the measuring of the water-holding capacity of the soil .....</b>	<b>16</b>
<b>Annex D (informative) Recommendations for nutrient supply of soils .....</b>	<b>17</b>
<b>Bibliography .....</b>	<b>18</b>

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 11269-2 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological methods*.

This third edition cancels and replaces the second edition (ISO 11269-2:2005), which has been technically revised.

ISO 11269 consists of the following parts, under the general title *Soil quality — Determination of the effects of pollutants on soil flora*:

- *Part 1: Method for the measurement of inhibition of root growth*
- *Part 2: Effects of contaminated soil on the emergence and early growth of higher plants*

## Introduction

This part of ISO 11269 describes a procedure for evaluating the quality of soils of different origin carrying unknown contaminations. The evaluation of the effects on plant growth is based on emergence and inhibitory effects on early growth of at least two species of higher plants. Guidance for assessing potential effects of substances on seedling emergence and growth is given in OECD Guideline 208<sup>[14]</sup>.

This part of ISO 11269 refers closely to ISO 22030 and is based on:

- a) results from the German research project “Entwicklung eines innovativen und technischen Instrumentariums zur Optimierung der ökotoxikologischen Bewertung von Böden im Hinblick auf Sanierungsziele und Schutzerfordernisse”;
- b) discussions within the joint project “Ecotoxicological Test Batteries” forming part of the BMBF Joint Research Group “Processes for the Bioremediation of Soil”<sup>[23]</sup>;
- c) results from the BMBF Joint Research Group ERNTE “Erprobung und Vorbereitung einer praktischen Nutzung ökotoxikologischer Testsysteme”<sup>[17]</sup>;
- d) ring-test results of “Ecotoxicological Characterisation of Waste — Results and Experiences from an International Ring Test”<sup>[8]</sup>.

Plant growth can be influenced strongly by soil properties such as texture, pH or levels of nutrients. When testing natural soils either reference soils (uncontaminated soils with the same properties as the test soil) or standard soils are used as mixing and control substrate. In the latter case, variations in plant growth can result from either soil contaminants or differences in soil properties like nutrients and texture. Therefore, results from soil testing can less easily be interpreted than results from testing of chemicals .



# Soil quality — Determination of the effects of pollutants on soil flora —

## Part 2: Effects of contaminated soil on the emergence and early growth of higher plants

**WARNING** — Contaminated soils may contain unknown mixtures of toxic, mutagenic, or otherwise harmful chemicals or infectious micro-organisms. Occupational health risks may arise from dust or evaporated chemicals during handling and incubation. Furthermore, test plants might take up chemicals from the soil and safety measures should also be considered when handling the test plants.

### 1 Scope

This part of ISO 11269 describes a method to assess the quality of an unknown soil and the soil habitat function by determining the emergence and early growth response of at least two terrestrial plant species compared to reference or standard control soils. It is applicable to soils of unknown quality, e.g. from contaminated sites, amended soils or soils after remediation.

### 2 Normative references

The following referenced documents are indispensable for the application 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 10381-6, *Soil quality — Sampling — Part 6: Guidance on the collection, handling and storage of soil under aerobic conditions for the assessment of microbiological processes, biomass and diversity in the laboratory*

ISO 10390, *Soil quality — Determination of pH*

ISO 10694, *Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis)*

ISO 11260, *Soil quality — Determination of effective cation exchange capacity and base saturation level using barium chloride solution*

ISO 11268-1, *Soil quality — Effects of pollutants on earthworms — Part 1: Determination of acute toxicity to *Eisenia fetida*/*Eisenia andrei**

ISO 11268-2, *Soil quality — Effects of pollutants on earthworms — Part 2: Determination of effects on reproduction to *Eisenia fetida*/*Eisenia andrei**

ISO 11277, *Soil quality — Determination of particle size distribution in mineral soil material — Method by sieving and sedimentation*

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

ISO 22030, *Soil quality — Biological methods — Chronic toxicity in higher plants*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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](#)
-