

Soil quality - Effects of pollutants on earthworms - Part  
1: Determination of acute toxicity to *Eisenia  
fetida*/*Eisenia andrei* (ISO 11268-1:2012)

## EESTI STANDARDI EESSÕNA

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English Version

Soil quality - Effects of pollutants on earthworms - Part 1:  
Determination of acute toxicity to *Eisenia fetida*/*Eisenia andrei*  
(ISO 11268-1:2012)

Qualité du sol - Effets des polluants vis-à-vis des vers de terre - Partie 1: Détermination de la toxicité aiguë vis-à-vis de *Eisenia fetida*/*Eisenia andrei* (ISO 11268-1:2012)

Bodenbeschaffenheit - Wirkungen von Schadstoffen auf Regenwürmer - Teil 1: Bestimmung der akuten Toxizität auf *Eisenia fetida*/*Eisenia andrei* (ISO 11268-1:2012)

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## European foreword

The text of ISO 11268-1:2012 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 11268-1:2015 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of an identical text or by endorsement, at the latest by February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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### Endorsement notice

The text of ISO 11268-1:2012 has been approved by CEN as EN ISO 11268-1:2015 without any modification.

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## Introduction

Ecotoxicological test systems are applied to obtain information about the effects of contaminants in soil and are proposed to complement conventional chemical analysis (see ISO 15799<sup>[33]</sup> and ISO 17616<sup>[34]</sup>). ISO 15799 includes a list and short characterization of recommended and standardized test systems, and ISO 17616 gives guidance on the choice and evaluation of the bioassays. Aquatic test systems with soil eluate are applied to obtain information about the fraction of contaminants potentially reaching the groundwater by the water path (retention function of soils), whereas terrestrial test systems are used to assess the habitat function of soils. As standardized test systems using earthworms as indicator organisms for the habitat function of soil, an acute test for survival and a chronic test for reproduction are available.

This part of ISO 11268 describes a method that is based on the determination of the acute toxicity of contaminated soils to adult earthworms of the species *Eisenia fetida* (Savigny 1826) and *Eisenia andrei* (André 1963). Optionally, the method can be used for testing chemicals added to a standard soil (e.g. artificial soil) for their acute toxic potential to earthworms. Finally, information is provided on how to use this method for testing chemicals under tropical conditions (see Annex A).

*Eisenia fetida* and *Eisenia andrei* are considered to be representatives of soil fauna and earthworms in particular. Background information on the ecology of earthworms and their use in ecotoxicological testing is available. Other species, e.g. *Aporrectodea caliginosa*, *Lumbricus rubellus* and *Lumbricus terrestris*, have also been used as test organisms. These or other species have not been proven to be more sensitive in general, and the database and experience in testing soils is small<sup>[15][16][23]</sup>.

This part of ISO 11268 has been drawn up taking into consideration test procedures adopted by the Organization for Economic Cooperation and Development<sup>[26][27]</sup> and by the European Union<sup>[9]</sup>.

# Soil quality — Effects of pollutants on earthworms —

## Part 1:

### Determination of acute toxicity to *Eisenia fetida*/*Eisenia andrei*

**WARNING**— Contaminated soils may contain unknown mixtures of toxic, mutagenic, or otherwise harmful chemicals or infectious microorganisms. Occupational health risks may arise from dust or evaporated chemicals during handling and incubation. Precautions should be taken to avoid skin contact.

## 1 Scope

This part of ISO 11268 specifies one of the methods for evaluating the habitat function of soils and determining the acute toxicity of soil contaminants and chemicals to *Eisenia fetida*/*Eisenia andrei* by dermal and alimentary uptake. It is applicable to soils and soil materials of unknown quality, e.g. from contaminated sites, amended soils, soils after remediation, agricultural or other sites concerned, and waste materials.

Effects of substances are assessed using a standard soil, preferably a defined artificial soil substrate. For contaminated soils, the effects on survival are determined in the test soil and in a control soil. According to the objective of the study, the control and dilution substrate (dilution series of contaminated soil) should be either an uncontaminated soil comparable to the soil sample to be tested (reference soil) or a standard soil (e.g. artificial soil).

Information is provided on how to use this method for testing chemicals under temperate as well as under tropical conditions.

The method is not applicable to volatile substances, i.e. substances for which  $H$  (Henry's constant) or the air/water partition coefficient is greater than 1, or for which the vapour pressure exceeds 0,013 3 Pa at 25 °C.

This method does not take into account the possible degradation of the substances or contaminants during the test.

## 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 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*