SLOVENSKI STANDARD
oSIST prEN ISO 11268-1:2026

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Kakovost tal - Učinki onesnaževal na deževnike - 1. del: Določanje akutne strupenosti za Eisenia fetida/Eisenia andrei in druge vrste deževnikov (ISO/DIS 11268-1:2026)

Soil quality - Effects of pollutants on earthworms - Part 1: Determination of acute toxicity to Eisenia fetida/Eisenia andrei and other earthworm species (ISO/DIS 11268-1:2026)

Bodenbeschaffenheit - Auswirkungen von Schadstoffen auf Regenwürmer - Teil 1: Bestimmung der akuten Toxizität für Eisenia fetida/Eisenia andrei (ISO/DIS 11268-1:2026)

Qualité du sol - Effets des polluants vis-à-vis des vers de terre - Partie 1: Détermination de la toxicité aiguë vis-à-vis d'Eisenia fetida/Eisenia andrei et d'autres espèces de vers de terre (ISO/DIS 11268-1:2026)

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ISO/DIS 11268-1

Soil quality — Effects of pollutants on earthworms —

Part 1: Determination of acute toxicity to *Eisenia fetida/Eisenia andrei* and other earthworm species

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 *et d'autres espèces de vers de terre*

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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.

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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.

This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological characterization*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, Environmental characterization, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement) .

This third edition cancels and replaces the second edition (ISO 11268-1:2012), which has been technically revised.

The main changes are as follows:

— correction of the vapour pressure value to update Clause 1 according to the recommendations of ECHA/OECD;

— inclusion of additional technical information on the testing of waste materials;

— inclusion of alternative species of earthworms – *Dendrodrilus rubidus, Aporrectodea caliginosa* – in informative annexes; information on their taxonomy and ecology as well as their specific testing requirements have also been added;

— inclusion of a test design to acquire data for toxicokinetic-toxicodynamic (TKTD) modelling in an informative annex.

A list of all the parts in the ISO 11268 series can be found on the ISO website.

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 [1] and ISO 17616 [2]). ISO 15799 [1] includes a list and short characterization of recommended and standardized test systems, and ISO 17616 [2] 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 laboratory 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 or waste materials 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. However, these species do not occur regularly in agricultural lands (crop sites and grasslands) or forests in these regions. In addition, they are not representative of boreal or tropical regions. Therefore, other species such as *Dendrodilus rubidus* (an epigeic litter inhabitant in boreal regions) and *Aporrectodea caliginosa* (an endogeic mineral dweller in temperate regions) have been added as potential alternative test species (see Annex E and Annex F). Other species, e.g. *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, but the data basis and experience in testing soils are small.[3][4][5]

This part of ISO 11268 has been drawn up taking into consideration test procedures adopted by the Organization for Economic Cooperation and Development (OECD 207 [6], OECD 222 [7]).

Soil quality — Effects of pollutants on earthworms —

Part 1: Determination of acute toxicity to *Eisenia fetida/Eisenia andrei* and other earthworm species

WARNING — 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, waste materials 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) can 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 substances for which the air/soil partition coefficient is greater than one, or to substances with vapour pressure exceeding 300 Pa at 25 °C.

This method does not take into account the possible degradation of the substances or contaminants during the test. This method also includes technical information on how to use it with other environmentally relevant earthworm species, i.e. *Dendrodrilus rubidus* and *Aporrectodea caliginosa* (see Annex E and Annex F) as well as a test design to acquire data for toxicokinetic-toxicodynamic (TKTD) modelling (Annex G).

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.

ISO 10390, *Soil, treated biowaste and sludge – 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*