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Soil quality - Avoidance test for determining the quality of soils and effects of chemicals on behaviour - Part 2: Test with collembolans (Folsomia candida) (ISO 17512-2:2011)

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EUROPEAN STANDARD

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Soil quality - Avoidance test for determining the quality of soils and effects of chemicals on behaviour - Part 2: Test with collembolans (Folsomia candida) (ISO 17512-2:2011)

Qualité du sol - Essai d'évitement pour contrôler la qualité des sols et les effets des produits chimiques sur le comportement - Partie 2: Essai avec des collemboles (Folsomia candida) (ISO 17512-2:2011)

Bodenbeschaffenheit - Vermeidungsprüfung zur Bestimmung der Bodenbeschaffenheit und der Auswirkungen von Chemikalien auf das Verhalten - Teil 2: Prüfung mit Collembolen (Folsomia candida) (ISO 17512-2:2011)

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European foreword

The text of ISO 17512-2:2011 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 17512-2:2020 by Technical Committee CEN/TC 444 "Environmental characterization of solid matrices" 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of an identical text or by endorsement, at the latest by November 2020, and conflicting national standards shall be withdrawn at the latest by November 2020.

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Introduction

The use of the avoidance behaviour of soil invertebrates as an indicator of unfavourable conditions allows a preliminary assessment of contaminated soils in a short period of time, with a high degree of sensitivity. Being rapid, cost-effective and ecologically relevant, the avoidance tests with earthworms were proposed to complement conventional chemical analysis. Supporting the results obtained in the chronic tests, the avoidance bioassays can be used as a first screening tool in the assessment of the habitat function of soils. Considering the fact that the avoidance response of soil invertebrates differs between species due to their distinct sensitivity to contaminants and modes of exposure, it is recommended to standardize a second rapid cost-effective and ecologically relevant avoidance bioassay.

Springtails have shown a distinct sensitivity towards several contaminants when compared with earthworms, complementing the information obtained in the avoidance tests with earthworms [1][2]. Until now, the species *Folsomia candida* has been the most commonly used collembolan test species due to a great facility to keep laboratory cultures and due to their high locomotor ability [3]. *Folsomia candida* is considered to be a hemi-edaphic species, meaning that it lives mainly in the soil. Furthermore, this species is already used in ISO 11267.

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Soil quality — Avoidance test for determining the quality of soils and effects of chemicals on behaviour —

Part 2: Test with collembolans (*Folsomia candida*)

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1 Scope

This part of ISO 17512 specifies a rapid screening method for evaluating the habitat function of soils based on the avoidance behaviour of springtails.

The test is a rapid method that reflects the bioavailability of contaminants in natural soils and substances spiked into soils to *Folsomia candida*. In both cases, it is possible to establish a dose-response-relationship. The avoidance behaviour of the springtails is the measurement endpoint of the test. This test is not intended to replace the Collembola reproduction 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 10390, *Soil quality — Determination of pH*

ISO 11267:1999, *Soil quality — Inhibition of reproduction of Collembola (Folsomia candida) by soil pollutants*

ISO 11268-2:1998, *Soil quality — Effects of pollutants on earthworms (Eisenia fetida) — Part 2: Determination of effects on reproduction*

ISO 11269-2, *Soil quality — Determination of the effects of pollutants on soil flora — Part 2: Effects of contaminated soils on the emergence and early growth of higher plants*

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

ISO 15799, *Soil quality — Guidance on the ecotoxicological characterization of soils and soil materials*

3 Terms and definitions

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

3.1
avoidance behaviour
tendency (of an organism) to avoid the test soil while preferring the control soil

[ISO 17512-1:2008]

3.2
test soil
either a natural or an artificial clean soil that is spiked with the test substance or a contaminated natural soil (a site soil)

3.3
control soil
natural or artificial uncontaminated soil

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