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Standards

Irish Standard  
I.S. EN ISO 15952:2011

# Soil quality - Effects of pollutants on juvenile land snails (Helicidae) - Determination of the effects on growth by soil contamination (ISO 15952:2006)

## I.S. EN ISO 15952:2011

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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 15952:2011

*Published:*  
28 June, 2011

This document was published  
under the authority of the NSAI  
and comes into effect on:  
28 June, 2011

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

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I.S. EN ISO 15952:2011

EUROPEAN STANDARD

**EN ISO 15952**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2011

ICS 13.080.30

English Version

**Soil quality - Effects of pollutants on juvenile land snails  
(Helicidae) - Determination of the effects on growth by soil  
contamination (ISO 15952:2006)**

Qualité du sol - Effets des polluants vis-à-vis des escargots  
juvéniles (Helicidae) - Détermination des effets sur la  
croissance par contamination du sol (ISO 15952:2006)

Bodenbeschaffenheit - Wirkungen von Schadstoffen auf  
Jungtiere von Landschnecken - Bestimmung der  
Wirkungen auf das Wachstum durch Bodenverunreinigung  
(ISO 15952:2006)

This European Standard was approved by CEN on 10 June 2011.

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

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## **Foreword**

The text of ISO 15952:2006 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 15952:2011 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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### **Endorsement notice**

The text of ISO 15952:2006 has been approved by CEN as a EN ISO 15952:2011 without any modification.

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I.S. EN ISO 15952:2011

# INTERNATIONAL STANDARD

**ISO**  
**15952**

First edition  
2006-02-15

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## **Soil quality — Effects of pollutants on juvenile land snails (*Helicidae*) — Determination of the effects on growth by soil contamination**

*Qualité du sol — Effets des polluants vis-à-vis des escargots juvéniles  
(Helicidae) — Détermination des effets sur la croissance par  
contamination du sol*



Reference number  
ISO 15952:2006(E)

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Published in Switzerland



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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.

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 15952 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 4, *Biological methods*.

## Introduction

Because of the limited amount of data available concerning toxicity of contaminants on soil organisms, the problems of assessing the ecotoxicity of soils and waste are cause for serious concern at both national and international levels. Currently available tests use soil-fauna organisms restricted to annelid (earthworms and *Enchytraeidae*) and arthropod phyla (insects: Collembola and Coleoptera). Among the latter, two standards assess acute toxicity [earthworms (ISO 11268-1) and coleoptera larvae <sup>[5]</sup>] and three other standards assess sublethal effects of soil contaminants on reproduction (earthworms <sup>[2]</sup>, Collembola <sup>[1]</sup>, *Enchytraeidae* <sup>[3]</sup>). In the biological cycles of organisms, it appears that growth is, like reproduction, a fundamental ecophysiological parameter to be taken into consideration for the sustainability of species and ecosystems <sup>[33]</sup>.

Snails are pertinent ecological indicators for assessing the quality of soils <sup>[15]</sup>, as they are characteristic of the soil surface layer (saprophagous and phytophagous) of which a large part of the biological cycle takes place in the soil (egg-laying, hatching, initial stages of development, hibernation, etc.) <sup>[6]</sup>, <sup>[17]</sup>, <sup>[26]</sup>. During the other phases of their cycle, they eat soil and are in contact with the soil via their moist pedal sole (foot) covered with mucus and participate in the permanent exchanges with the soil (water, mineral salts, excrement and finally shell and organic matter when they die) <sup>[6]</sup>, <sup>[17]</sup>, <sup>[28]</sup>. In addition, they constitute an important link between plants, fauna and soil microorganisms. They correspond fully to the criteria for a good biological indicator: easy to sample and identify, they are widely distributed; they accumulate contaminants <sup>[8, 10 to 14, 16, 17, 19, 21, 26, 27, 35 to 43]</sup>; their ecological and physiological characteristics are well-known <sup>[6]</sup>, <sup>[9]</sup>, <sup>[29]</sup>; and they are now easy to breed under controlled conditions <sup>[19]</sup>, <sup>[23]</sup>, <sup>[29]</sup>. Their susceptibility to common contaminants of their environment has been demonstrated <sup>[10 to 15, 18 to 27, 32, 33, 36 to 42]</sup>.

This International Standard describes a method for determining the effects on survival and growth of young snails of substances, preparations, soils or waste materials added to an artificial or a natural soil. The described method is thus applicable to test contaminated soils or to compare different uncontaminated soils. The recommended species is *Helix aspersa aspersa* Müller (also commonly called: common garden snail, brown garden snail, garden snail, land snail, "Petit-Gris"). Among land snails (stylommatophoran pulmonate gastropod molluscs of the *Helicidae* family), *Helix aspersa aspersa* Müller is the most ubiquitous. This palearctic species can be acclimated to regions with different types of climate: Mediterranean, oceanic temperate, midcontinental temperate and even tropical. *Helix aspersa aspersa* Müller is of European origin and has been introduced into all parts of the world. They are now on all continents except Antarctica <sup>[9]</sup>.

Indeed, in their natural environment, snails integrate the contaminants by contact (with various substrates such as soil, soil leachates, plant litter), by ingestion (of plants and soil), as well as through the respiratory tract <sup>[6]</sup>, <sup>[26]</sup>. So, for specific testing purposes (evaluation of the toxicity of a pesticide, for example), another test design, which is focussed on exposure via food uptake, is optionally available (Annex F and Reference <sup>[4]</sup>).

**I.S. EN ISO 15952:2011**

# Soil quality — Effects of pollutants on juvenile land snails (*Helicidae*) — Determination of the effects on growth by soil contamination

## 1 Scope

This International Standard specifies a semi-static method for the determination of the effects of contaminants on growth and survival of young snails, usually *Helix aspersa aspersa* Müller. The animals are exposed via the cutaneous and digestive route using a test substrate (artificial or natural soil according to the objective of the study) to which defined amounts of the following are added:

- substances or preparations;
- soils (contaminated or of unknown quality) or waste materials.

A static method may be implemented in addition to the semi-static method (optional). This method is described in Annex A.

This method does not apply to volatile substances, i.e. substances for which the Henry constant,  $H$ , or the air/water partition coefficient is over 1, or for which the vapour pressure is over 0,013 3 Pa at 25 °C.

This test takes into account the possible change in the test substance, preparation, soil or waste material because the test mixture is prepared and renewed every 7 days during the 28-day test period.

## 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 for the assessment of aerobic microbial processes 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 11268-1, *Soil quality — Effects of pollutants on earthworms (Eisenia fetida) — Part 1: Determination of acute toxicity using artificial soil substrate*

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

ISO 11274, *Soil quality — Determination of the water-retention characteristic — Laboratory methods*

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

EN 14735, *Characterization of waste — Preparation of waste samples for ecotoxicity tests*

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