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Soil quality - Determination of the water-retention characteristic - Laboratory methods (ISO 11274:2019)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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Soil quality - Determination of the water-retention characteristic - Laboratory methods (ISO 11274:2019)

Qualité du sol - Détermination de la caractéristique de la rétention en eau - Méthodes de laboratoire (ISO 11274:2019)

Bodenbeschaffenheit - Bestimmung des Wasserrückhaltevermögens - Laborverfahren (ISO 11274:2019)

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EN ISO 11274:2019 (E)

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European foreword

This document (EN ISO 11274:2019) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 444 "Test methods for 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of an identical text or by endorsement, at the latest by April 2020, and conflicting national standards shall be withdrawn at the latest by April 2020.

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The text of ISO 11274:2019 has been approved by CEN as EN ISO 11274:2019 without any modification.

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Soil quality — Determination of the water-retention characteristic — Laboratory methods

*Qualité du sol — Détermination de la caractéristique de la rétention
en eau — Méthodes de laboratoire*



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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

This second edition cancels and replaces the first edition (ISO 11274:1998), which has been technically revised. It also incorporates the Technical Corrigendum ISO 11274:1998/Cor. 1:2009.

ISO 11274:2019(E)

Introduction

Soil water content and matric pressure are related to each other and determine the water-retention characteristics of a soil. Soil water which is in equilibrium with free water is at zero matric pressure (or suction) and the soil is saturated. As the soil dries, matric pressure decreases (i.e. becomes more negative), and the largest pores empty of water. Progressive decreases in matric pressure will continue to empty finer pores until eventually water is held in only the finest pores. Not only is water removed from soil pores, but the films of water held around soil particles are reduced in thickness. Therefore a decreasing matric pressure is associated with a decreasing soil water content^{[9][10]}. Laboratory or field measurements of these two parameters can be made and the relationship plotted as a curve, called the soil water-retention characteristic. The relationship extends from saturated soil (approximately 0 kPa) to oven-dry soil (about -10^6 kPa).

The soil water-retention characteristic is different for each soil type. The shape and position of the curve relative to the axes depend on soil properties such as texture, density and hysteresis associated with the wetting and drying history. Individual points on the water-retention characteristic may be determined for specific purposes.

The results obtained using these methods can be used, for example:

- to provide an assessment of the equivalent pore size distribution (e.g. identification of macro- and micropores);
- to determine indices of plant-available water in the soil and to classify soil accordingly (e.g. for irrigation purposes);
- to determine the drainable pore space (e.g. for drainage design, pollution risk assessments);
- to monitor changes in the structure of a soil (caused by e.g. tillage, compaction or addition of organic matter or synthetic soil conditioners);
- to ascertain the relationship between the negative matric pressure and other soil physical properties (e.g. hydraulic conductivity, thermal conductivity);
- to determine water content at specific negative matric pressures (e.g. for microbiological degradation studies);
- to estimate other soil physical properties (e.g. hydraulic conductivity).

Soil quality — Determination of the water-retention characteristic — Laboratory methods

1 Scope

This document specifies laboratory methods for determination of the soil water-retention characteristic.

This document applies only to measurements of the drying or desorption curve.

Four methods are described to cover the complete range of soil water pressures as follows:

- a) method using sand, kaolin or ceramic suction tables for determination of matric pressures from 0 kPa to -50 kPa;
- b) method using a porous plate and burette apparatus for determination of matric pressures from 0 kPa to -20 kPa;
- c) method using a pressurized gas and a pressure plate extractor for determination of matric pressures from -5 kPa to -1 500 kPa;
- d) method using a pressurized gas and pressure membrane cells for determination of matric pressures from -33 kPa to -1 500 kPa.

Guidelines are given to select the most suitable method in a particular case.

2 Normative references

There are no normative references in this document.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN