# SLOVENSKI STANDARD
# SIST EN ISO 11275:2014

**01-maj-2014**

---

**Kakovost tal - Določanje hidravlične prevodnosti in karakteristik zadrževanja vode v nenasičenih tleh - Metoda izhlapevanja po Windu (ISO 11275:2004)**

Soil quality - Determination of unsaturated hydraulic conductivity and water-retention characteristic - Wind's evaporation method (ISO 11275:2004)

Bodenbeschaffenheit - Bestimmung der ungesättigten hydraulischen Leitfähigkeit und des Wasserrückhaltevermögens - Evaporationsverfahren nach Wind (ISO 11275:2004)



Qualité du sol - Détermination de la conductivité hydraulique en milieu non saturé et de la caractéristique de rétention en eau - Méthode par évaporation de Wind (ISO 11275:2004)



**Ta slovenski standard je istoveten z:** **EN ISO 11275:2014**

---

**ICS:**

| | | |
|---|---|---|
| 13.080.40 | Hidrološke lastnosti tal | Hydrological properties of soils |

**SIST EN ISO 11275:2014** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 11275

March 2014

ICS 13.080.40

English Version

# Soil quality - Determination of unsaturated hydraulic conductivity and water-retention characteristic - Wind's evaporation method (ISO 11275:2004)

Qualité du sol - Détermination de la conductivité hydraulique en milieu non saturé et de la caractéristique de rétention en eau - Méthode par évaporation de Wind (ISO 11275:2004)

Bodenbeschaffenheit - Bestimmung der ungesättigten hydraulischen Leitfähigkeit und des Wasserrückhaltevermögens - Verdunstungsverfahren nach Wind (ISO 11275:2004)

This European Standard was approved by CEN on 13 March 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.



This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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



Ref. No. EN ISO 11275:2014 E

## Contents

Page

# Foreword

The text of ISO 11275:2004 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 11275:2014 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 September 2014, and conflicting national standards shall be withdrawn at the latest by September 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**Endorsement notice**

The text of ISO 11275:2004 has been approved by CEN as EN ISO 11275:2014 without any modification.

INTERNATIONAL STANDARD

**ISO 11275**

First edition
2004-07-01

Corrected version
2004-11-01

# Soil quality — Determination of unsaturated hydraulic conductivity and water-retention characteristic — Wind's evaporation method

*Qualité du sol — Détermination de la conductivité hydraulique en milieu non saturé et de la caractéristique de rétention en eau — Méthode par évaporation de Wind*



Reference number
ISO 11275:2004(E)

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.





ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

 

## Contents

Page

## 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 11275 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 5, *Physical methods*.



This corrected version of ISO 11275:2004 incorporates the following corrections of inadvertent omissions:



a) in Equation (5) a minus sign has been added to the numerator on the right-hand side of the equation;

b) in Equation (9) a fourth term, $\widehat{\varphi}_{i,j+1}$, has been added to the right-hand side of the equation.

## 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 either the soil is saturated or the gaseous phase occurs only as small bubbles. As a saturated soil dries, the 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 decreasing soil water content[8],[9]. Laboratory or field measurements of these two parameters can be made; and the relationship (which can be reported graphically, in tabular form, or possibly as an equation) is called the soil water-retention characteristic. The relationship extends from saturated soil to oven-dry soil (approximately 0 kPa to about $-10^6$ kPa matric pressure).

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 curve may be defined for specific purposes.

The hydraulic conductivity is a measure of the rate at which liquid water can move through the soil under the influence of variations in matric pressure from point to point within the soil. The hydraulic conductivity of unsaturated soil depends on the same factors as does the soil water-retention characteristic, also showing hysteresis. As a saturated soil dries, the hydraulic conductivity decreases, and it is convenient to express the hydraulic conductivity corresponding to the soil water-retention characteristic as a function of the decreasing matrix pressure.



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 micro-pores);

— 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.