SLOVENSKI STANDARD
SIST EN ISO 22282-2:2012
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Geotehnično preiskovanje in preskušanje - Hidrogeološke preiskave - 2. del: Ugotavljanje vodoprepustnosti v vrtini z uporabo odprtih sistemov (ISO 22282-2:2012)

Geotechnical investigation and testing - Geohydraulic testing - Part 2: Water permeability tests in a borehole using open systems (ISO 22282-2:2012)

Geotechnische Erkundung und Untersuchung - Geohydraulische Versuche - Teil 2: Wasserdurchlässigkeitsversuche in einem Bohrloch unter Anwendung offener Systeme (ISO 22282-2:2012)

Reconnaissance et essais géotechniques - Essais géohydrauliques - Partie 2: Essais de perméabilité à l'eau dans un forage en tube ouvert (ISO 22282-2:2012)

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93.020	Zemeljska dela. Izkopavanja. Gradnja temeljev. Dela pod zemljo	Earthworks. Excavations. Foundation construction. Underground works

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EUROPEAN STANDARD

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EN ISO 22282-2

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ICS 93.020

English Version

Geotechnical investigation and testing - Geohydraulic testing - Part 2: Water permeability tests in a borehole using open systems (ISO 22282-2:2012)

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Foreword

This document (EN ISO 22282-2:2012) has been prepared by Technical Committee CEN/TC 341 “Geotechnical Investigation and Testing", the secretariat of which is held by ELOT, in collaboration with Technical Committee ISO/TC 182 "Geotechnics".

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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

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INTERNATIONAL STANDARD

ISO 22282-2

First edition
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Geotechnical investigation and testing — Geohydraulic testing —

Part 2: Water permeability tests in a borehole using open systems

Reconnaissance et essais géotechniques — Essais géohydrauliques — Partie 2: Essais de perméabilité à l'eau dans un forage en tube ouvert

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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.

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ISO 22282-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 341, *Geotechnical investigation and testing*, in collaboration with Technical Committee ISO/TC 182, *Geotechnics*, Subcommittee SC 1, *Geotechnical investigation and testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 22282 consists of the following parts, under the general title *Geotechnical investigation and testing — Geohydraulic testing*:

— *Part 1: General rules*

— *Part 2: Water permeability tests in a borehole using open systems*

— *Part 3: Water pressure tests in rock*

— *Part 4: Pumping tests*

— *Part 5: Infiltrometer tests*

— *Part 6: Water permeability tests in a borehole using closed systems*

Geotechnical investigation and testing — Geohydraulic testing —

Part 2:
Water permeability tests in a borehole using open systems

1 Scope

This part of ISO 22282 specifies requirements for the determination of the local permeability in soils and rocks below and above groundwater level in an open hole by water permeability tests as part of the geotechnical investigation services according to EN 1997-1 and EN 1997-2.

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 14688-1, *Geotechnical investigation and testing — Identification and classification of soil — Part 1: Identification and description*

ISO 14689-1, *Geotechnical investigation and testing — Identification and classification of rock — Part 1: Identification and description*

ISO 22282-1: 2011, *Geotechnical investigation and testing — Geohydraulic testing — Part 1: General rules*

ISO 22475-1, *Geotechnical investigation and testing — Sampling methods and groundwater measurements — Part 1: Technical principles for execution*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22475-1 and ISO 22282-1 apply.

3.2 Symbols

For the purposes of this document, the symbols given in Table 1 apply.

Table 1 — Symbols

Symbol	Designation	Unit
A_c	area of the inner cross-section of the casing	m^2
A_r	area of the water surface in the reservoir	m^2
D	borehole diameter, diameter of the test section	m
F	shape factor	m
h	hydraulic head of the test	m
h_1, h_2, h_3	applied hydraulic heads	m
h_o	distance of the water level from the ground level	m
Δh	change in hydraulic head	m
k	permeability coefficient	m/s
k_{fs}	field saturated permeability coefficient	m/s
L	length (height) of the test section	m
Q	flow rate	m^3/s
r	radius	–
S	storage coefficient	–
T	transmissivity	–
t_i	time needed to reach the equilibrium	s
t	time	s
t_o	time at start of test	s
$\dot{V}$	volume flow rate	

4 Test principle

The test is based on the assumption that the test section is isolated and located above or below the groundwater surface.

The results can vary depending on the test type chosen (water withdrawal or injection) according to the purpose of the test.

Three test methods are available:

a) Constant flow rate test method (suitable for k-value greater than 10^{-6} m/s)

This test consists of producing a change in hydraulic head in a section of a borehole by injecting or withdrawing a constant flow rate. The change in hydraulic head is measured against time.

b) Variable head test method (suitable for k-value between 10^{-6} m/s and 10^{-9} m/s)

This test consists of producing an instant change in hydraulic head in a section of a borehole. The change in hydraulic head is measured against time.

c) Constant head test method (suitable for k-value between 10^{-4} m/s and 10^{-7} m/s)

This test consists of maintaining a constant hydraulic head in a section of a borehole. The flow rate is measured against time.

5 Equipment

In addition to a casing or a piezometer, the following equipment is necessary:

a) water supply or plain rod for the falling head test;