Geotechnical investigation and testing - Geohydraulic testing - Part 6: Water permeability tests in a borehole using closed systems (ISO 22282-6:2012)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 22282-6:2012 sisaldab Euroopa standardi EN ISO 22282-6:2012 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 22282-6:2012 consists of the English text of the European standard EN ISO 22282-6:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.06.2012.	Date of Availability of the European standard is 01.06.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Geotechnical investigation and testing - Geohydraulic testing - Part 6: Water permeability tests in a borehole using closed systems (ISO 22282-6:2012)

Reconnaissance et essais géotechniques - Essais géohydrauliques - Partie 6: Essais de perméabilité à l'eau dans un forage en tube fermé (ISO 22282-6:2012)

Geotechnische Erkundung und Untersuchung - Geohydraulische Versuche - Teil 6: Wasserdurchlässigkeitsversuche im Bohrloch unter Anwendung geschlossener Systeme (ISO 22282-6:2012)

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Foreword

This document (EN ISO 22282-6:2012) 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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.

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.

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Geotechnical investigation and testing — Geohydraulic testing —

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

1 Scope

This part of ISO 22282 specifies requirements for the determination of the local permeability in soils and rocks below or above the groundwater table in a closed system by the water permeability tests as part of the geotechnical investigation services according to EN 1997-1 and EN 1997-2.

The tests are used to determine the permeability coefficient k in low permeability soil and rock lower than 10^{-8} m/s. It can also be used to determine the transmissivity T and the storage coefficient S.

NOTE The water pressure test in rock is covered by ISO 22282-3.

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, *Geotechnical investigation and testing — Geohydraulic tests — Part 1: General rules*

ISO 22475-1, *Geotechnical investigation and testing — Sampling method 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 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
C_{app}	apparent compressibility of the measurement device	Pa^{-1}
C_w	compressibility of the water	Pa^{-1}
F	shape factor	—
g	acceleration due to gravity	$m.s^{-2}$
h	hydraulic head	m
h_{st}	pre-test stabilized hydraulic head	m
k	permeability coefficient	$m.s^{-1}$
k_{20}	permeability coefficient at a temperature of 20 °C	$m.s^{-1}$
L	height of the cavity	m
p	pressure	Pa
Q	flow rate	$m^3.s^{-1}$
r_c	radius of the measurement cavity and of the borehole	m
S	storage coefficient	—
T	transmissivity ($T = k\,L$)	$m^2.s^{-1}$
t	time	s
V	volume	m^3
V_w	volume of water submitted to pressure pulse	m^3
z_c	height of the middle of the cavity in relation to the natural land	m
z_{capt}	height of the pressure sensor in relation to the natural land	m
η	dynamic viscosity of the water	Pa.s
ρ_w	density of the water	$kg.m^{-3}$
Δh_0	variation in initial hydraulic head	m
ΔV_0	variation in initial volume	m^3
Δp_0	variation in initial pressure	Pa

4 Equipment

The basic equipment consists of the following parts (see also the example in Figure 1):

— pump or pressure source capable of injecting or removing water to the water-filled system to produce a pressure pulse in the test interval;

— pipes;

— single or double packer;

— shut-off valve in the pipe above the test section;

— pressure measuring and recording device in test section;

— data acquisition system.