SLOVENSKI STANDARD

oSIST prEN ISO 22476-4:2008

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Geotehniļ no preiskovanje in preskuģanje - Preskuģanje na terenu - 4. del: Menardov preskus barometra (ISO/DIS 22476-4:2007)

Geotechnical investigation and testing - Field testing - Part 4: Ménard pressuremeter test (ISO/DIS 22476-4:2007)

Geotechnische Erkundung und Untersuchung - Felduntersuchungen - Teil 4: Pressiometerversuch nach Ménard (ISO/DIS 22476-4:2007)

Reconnaissance et essais géotechniques - Essais en place - Partie 4: Essai pressiométrique Ménard (ISO/DIS 22476-4:2007)

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EUROPEAN STANDARD

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English Version

Geotechnical investigation and testing - Field testing - Part 4: Ménard pressuremeter test (ISO/DIS 22476-4:2007)

Reconnaissance et essais géotechniques - Essais en place - Partie 4: Essai pressiométrique Ménard (ISO/DIS 22476-4:2007)

Geotechnische Erkundung und Untersuchung - Felduntersuchungen - Teil 4: Pressiometerversuch nach Ménard (ISO/DIS 22476-4:2007)

This draft European Standard is submitted to CEN members for second parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 341.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN ISO 22476-4:2007) 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 document is currently submitted to the second parallel Enquiry.

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Geotechnical investigation and testing — Field testing —

Part 4:
Ménard pressuremeter test

Reconnaissance et essais géotechniques — Essais en place —

Partie 4: Essai pressiométrique Ménard

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ISO/CEN PARALLEL ENQUIRY

This draft International Standard is a draft standard developed within the European Committee for Standardization (CEN) and processed under the CEN-lead mode of collaboration as defined in the Vienna Agreement. The document has been transmitted by CEN to ISO for circulation for ISO member body voting in parallel with CEN enquiry. Comments received from ISO member bodies, including those from non-CEN members, will be considered by the appropriate CEN technical body. Should this DIS be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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.

EN ISO 22476-4 was prepared by Technical Committee CEN/TC 341, *Geotechnical investigation and testing* and by Technical Committee ISO/TC 182, *Geotechnics*, in collaboration.

EN ISO 22476 consists of the following parts, under the general title Geotechnical investigation and testing — Field testing:

- *Part 1: Electrical cone penetration tests*
- *Part 2: Dynamic probing*
- *Part 3: Standard penetration test*
- *Part 4:Menard pressuremeter test*
- *Part 5: Flexible dilatometer test*
- *Part 6: Self-boring pressuremeter test*
- *Part 7: Borehole jack test*
- *Part 8: Full displacement pressuremeter test*
- *Part 9: Field vane test*
- *Part 10: Weight sounding test*
- *Part 11: Flat dilatometer test*
- *Part 12: Mechanical cone penetration test*
- Part 13: Plate loading test
- Part 14: Phicometer test

Geotechnical investigation and testing — Field testing —

Part 4: **Ménard pressuremeter test**

1 Scope

This document deals with field testing using the Ménard pressuremeter test as part of geotechnical investigation and testing according to EN 1997-1 and EN 1997-2.

The present document describes the procedure for conducting a Ménard pressuremeter test in natural soils, treated or untreated fills and in very hard soils, or soft rocks, either on land or off-shore.

The pressuremeter sounding results of this document are well suited to a quantitative determination of soil strength and deformation parameters. Pressuremeters sounding results can yield lithological information. They can also be combined with direct investigation (e;g; sampling according to EN ISO 22475-1) or compared with other in situ tests (see EN 1997-2, 2.4.1.4(2) P, 4.1 (1) P and 4.2.3(2) P).

The Ménard pressuremeter test is performed by the radial expansion of a tricell probe placed in the ground (see Figure 1). During the injection of the liquid volume in the probe, the inflation of the three cells first brings the outer cover of the probe into contact with the borehole walls and then presses on them resulting in a soil displacement. Pressure applied to, and the associated volume expansion of the probe are measured and recorded so as to obtain the stress-strain relationship of the soil as tested.

This Standard refers to a probe historically described as the 60 mm G type probe. This standard applies to test depths limited to 50 m and test pressure limited to 5 MPa.

NOTE 1 In the following instances: Ménard pressuremeter tests carried out at pressures above 5 MPa, Ménard pressuremeter tests at depths exceeding 50m, Ménard pressuremeter tests carried out with E type probes, Full displacement pressuremeter tests, the test procedures and the test interpretations are not necessarily covered by this standard.

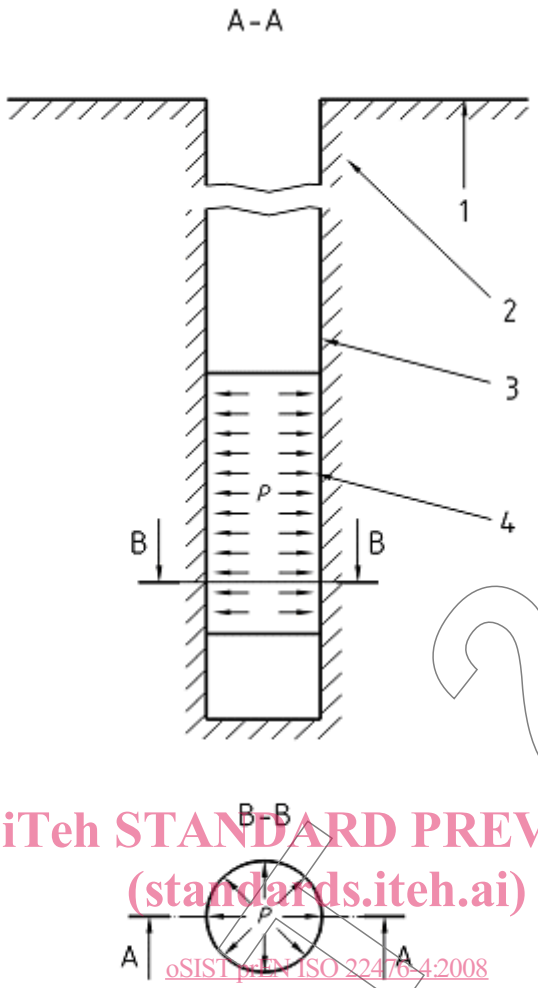
NOTE 2 Ménard pressuremeter tests can be carried out with other diameter probes such as 44 mm and 76 mm probes.

NOTE 3 Ménard pressuremeter tests can be carried out with a pressure exceeding 5 MPa or at a depth exceeding 50 m. However the corresponding test procedure and test interpretation are not covered by this standard.

Two alternative methods of measurement are provided as follows:

— procedure A: data is recorded manually;

— procedure B: data is recorded automatically.



Key

1 Ground surface
2 Ground
3 Borehole
4 Expanding pressuremeter probe

A – A axial section

B - B cross section

Figure 1 — Principle of a pressuremeter test

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.

EN 1997-1, Eurocode 7: Ground investigation and testing – *Part 1: General rules.*

EN 1997-2, Eurocode 7: Ground investigation and testing – *Part 2: Design assisted by laboratory and field testing*.

ENV 13005:1999, *Guide to the expression of uncertainty in measurement.*

EN ISO 14688-1, *Geotechnical investigation and testing – identification and classification of soil – Part 1: identification and description.*

EN ISO 14689-1, *Geotechnical investigation and testing – identification and classification of rock – Part 1: identification and description.*

EN ISO 22475-1, *Geotechnical investigation and testing – Sampling by drilling and excavationand ground water measurements – Part 1: Technical principles for execution*.

EN ISO 10012, *Measurement management systems – Requirements for measurement processes and measuring equipment*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1.1
pressuremeter
the whole equipment which is used to carry out a Ménard pressuremeter test, excluding the means . necessary to place the pressuremeter probe into the ground

A pressuremeter includes a pressuremeter probe, a pressure and volume control unit, called CU, lines to connect the probe to the CU and in the case of procedure B, a data logger which is either built into the CU or linked to it.

3.1.2 pressuremeter test pocket
A circular cylindrical cavity formed in the soil to receive a pressuremeter probe. The primary concern shall be the quality of the pocket wall obtained, using the methods described in Annex C.

3.1.3pressuremeter borehole
a borehole in which cylindrical pockets with circular cross sections are made in the ground, and into which the pressuremeter probe is to be placed.

3.1.4
pressuremeter test
the process during which a cylindrical probe is inflated in the ground and the resulting cavity expansion is measured by volume as a function of time and pressure increments according to a defined programme (see Figure 4)