



NSAI
Standards

Irish Standard
I.S. EN ISO 22476-12:2009

Geotechnical investigation and testing - Field testing - Part 12: Mechanical cone penetration test (CPTM) (ISO 22476 -12:2009)

I.S. EN ISO 22476-12:2009

Incorporating amendments/corrigenda issued since publication:

<i>This document replaces:</i>	<i>This document is based on:</i> EN ISO 22476-12:2009	<i>Published:</i> 15 May, 2009
This document was published under the authority of the NSAI and comes into effect on: 17 August, 2009		ICS number: 93.020
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Price Code: J		
Údarás um Chaighdeáin Náisiúnta na hÉireann		

ICS 93.020

English Version

**Geotechnical investigation and testing - Field testing - Part 12:
Mechanical cone penetration test (CPTM) (ISO 22476-12:2009)**

Reconnaissance et essais géotechniques - Essais en place
- Partie 12: Essai de pénétration statique au cône à pointe
mécanique (ISO 22476-12:2009)

Geotechnische Erkundung und Untersuchung -
Felduntersuchungen - Teil 12: Drucksondierungen mit
mechanischen Messwertaufnehmern (ISO 22476-12:2009)

This European Standard was approved by CEN on 16 April 2009.

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 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 Management Centre has the same status as the official versions.

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



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
----------------------	----------

Foreword

This document (EN ISO 22476-12:2009) 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 November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

This page is intentionally left BLANK.

I.S. EN ISO 22476-12:2009

INTERNATIONAL STANDARD

ISO
22476-12

First edition
2009-05-15

Geotechnical investigation and testing — Field testing —

Part 12: Mechanical cone penetration test (CPTM)

Reconnaissance et essais géotechniques — Essais en place —

Partie 12: Essai de pénétration statique au cône à pointe mécanique



Reference number
ISO 22476-12:2009(E)

© ISO 2009

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.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2009

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions, symbols and abbreviated terms.....	2
3.1 Terms and definitions.....	2
3.2 Symbols and abbreviated terms	6
4 Equipment	6
4.1 Cone penetrometer load sensors.....	6
4.2 Tolerances	6
4.3 Surface roughness	7
4.4 Cone penetrometer	7
4.5 Cone	8
4.6 Friction sleeve.....	9
4.7 Push rods	11
4.8 Inner rods	11
4.9 Measuring system.....	11
4.10 Thrust machine	12
5 Test procedures	12
5.1 Selection of type of cone penetrometer test.....	12
5.2 Selection of equipment and procedures	13
5.3 Position and level of thrust machine	15
5.4 Preparation	15
5.5 Pushing of the cone penetrometer	15
5.6 Use of friction reducer.....	15
5.7 Frequency of logging parameters.....	15
5.8 Measurement of cone penetration force for discontinuous penetration testing	15
5.9 Measurement of cone penetration force for continuous testing	16
5.10 Measurement of sleeve friction force for discontinuous testing with M2 cone penetrometers	16
5.11 Measurement of total penetration force for discontinuous testing.....	16
5.12 Measurement of total penetration force for continuous testing (TM4)	16
5.13 Measurement of the penetration length	16
5.14 Test completion	16
5.15 Equipment checks and calibrations	17
6 Test results	17
6.1 Measured parameters.....	17
6.2 Calculated parameters	17
7 Reporting	17
7.1 General.....	17
7.2 Reporting of test results	17
7.3 Presentation of test results	20
Annex A (normative) Maintenance, checks and calibration	21
Bibliography	23

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 22476-12 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 341, in collaboration with ISO Technical Committee 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 22476 consists of the following parts, under the general title *Geotechnical investigation and testing* — *Field testing*:

- *Part 2: Dynamic probing*
- *Part 3: Standard penetration test*
- *Part 4: Ménard pressuremeter test*
- *Part 5: Flexible dilatometer test*
- *Part 7: Borehole jack test*
- *Part 10: Weight sounding test* [Technical Specification]
- *Part 11: Flat dilatometer test* [Technical Specification]
- *Part 12: Mechanical cone penetration test (CPTM)*

Electrical cone and piezocone penetration tests, self-boring pressuremeter test, full displacement pressuremeter test, and field vane test are to form the subjects of future parts 1, 6, 8 and 9.

Introduction

The mechanical cone penetration test (CPTM) consists of pushing a cone penetrometer, by means of a series of push rods, into the soil at a constant rate of penetration. During penetration, measurements of cone penetration resistance, total penetration resistance and/or sleeve friction can be recorded. The test results can be used for interpretation of stratification, classification of soil type and evaluation of geotechnical parameters.

Cone resistance is the term used in practice; however, *cone penetration resistance* is a more accurate description of the process, and is the term used in this part of ISO 22476.

I.S. EN ISO 22476-12:2009

Geotechnical investigation and testing — Field testing —

Part 12:

Mechanical cone penetration test (CPTM)

1 Scope

This part of ISO 22476 specifies a mechanical cone penetration test (CPTM), including equipment requirements, execution and reporting. The results from such geotechnical testing are especially suited to the qualitative and/or quantitative determination of a soil profile — together with direct investigations — or as a relative comparison with other *in situ* tests.

The results from a cone penetration test can in principle be used to evaluate stratification, soil type, and geotechnical parameters such as soil density, shear-strength parameters and deformation and consolidation characteristics.

This part of ISO 22476 specifies the following features:

- type of cone penetration test (see Table 1);
- application class (see Table 2);
- penetration length or penetration depth;
- elevation of the ground surface or underwater ground surface at the location of the cone penetration test with reference to a datum;
- location of the cone penetration test relative to a reproducible fixed location reference point.

NOTE The planning and evaluation of an investigation programme and the application of its results to design are covered by 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 8503 (all parts), *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates*

ISO 10012:2003, *Measurement management systems — Requirements for measurement processes and measuring equipment*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-