

This is a preview of "BS EN ISO 22476-5:20...". Click here to purchase the full version from the ANSI store.

BS EN ISO 22476-5:2012



BSI Standards Publication

Geotechnical investigation and testing — Field testing

Part 5: Flexible dilatometer test

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™



This is a preview of "BS EN ISO 22476-5:20...". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN ISO 22476-5:2012. It partially supersedes BS 5930:1999+A2:2010, which is currently being revised in order to remove conflicting material.

The tests included in BS 5930:1999 (Clauses 25.7.2.1 and 25.7.4.1, and more generally in Clauses 27.7.3, 25.7.5 and 25.7.6) are also provided in this standard. In the meantime, where conflict arises between these documents, the provisions of BS EN ISO 22476-5:2012 take precedence.

The UK participation in its preparation was entrusted to Technical Committee B/526/3, Site investigation and ground testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.
Published by BSI Standards Limited 2013

ISBN 978 0 580 77122 4

ICS 93.020

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2013.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

This is a preview of "BS EN ISO 22476-5:20...". Click here to purchase the full version from the ANSI store.

EUROPÄISCHE NORM

December 2012

ICS 93.020

English Version

Geotechnical investigation and testing - Field testing - Part 5: Flexible dilatometer test (ISO 22476-5:2012)

Reconnaissance et essais géotechniques - Essais en place
- Partie 5: Essai au dilatomètre flexible (ISO 22476-5:2012)

Geotechnische Erkundung und Untersuchung -
Felduntersuchungen - Teil 5: Versuch mit dem flexiblen
Dilatometer (ISO 22476-5:2012)

This European Standard was approved by CEN on 25 November 2012.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

This is a preview of "BS EN ISO 22476-5:20...". [Click here to purchase the full version from the ANSI store.](#)

Foreword

This document (EN ISO 22476-5:2012) 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 June 2013, and conflicting national standards shall be withdrawn at the latest by June 2013.

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.

Selon le Règlement Intérieur du CEN/CENELEC, les instituts de normalisation nationaux des pays suivants sont tenus de mettre cette Norme européenne en application : Allemagne, Ancienne République yougoslave de Macédoine, Autriche, Belgique, Bulgarie, Chypre, Croatie, Danemark, Espagne, Estonie, Finlande, France, Grèce, Hongrie, Irlande, Islande, Italie, Lettonie, Lituanie, Luxembourg, Malte, Norvège, Pays-Bas, Pologne, Portugal, République tchèque, Roumanie, Royaume-Uni, Slovaquie, Slovénie, Suède, Suisse et Turquie.

This is a preview of "BS EN ISO 22476-5:20...". Click here to purchase the full version from the ANSI store.

Contents	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
3.1 Terms and definitions	1
3.2 Symbols and abbreviations	3
4 Equipment	5
4.1 General	5
4.2 Dilatometer probe	6
4.3 Pressure control and displacement measuring units	8
4.4 Connecting lines	8
4.5 Measurement and control accuracy	8
4.6 Data logging	9
5 Test procedure	9
5.1 Safety requirements	9
5.2 Assembly of parts	9
5.3 Calibration of the testing device and corrections of readings	9
5.4 Uncertainties of measurement	10
5.5 Preparation for the sounding	10
5.6 Pocket drilling and device placing	10
5.7 Test execution	11
5.8 End of loading	12
5.9 Back-filling of borehole	12
6 Test results	12
6.1 Basic equations	12
6.2 Loading test	13
6.3 Constant pressure tests (procedure D)	16
6.4 Uncorrected and corrected graphs	17
7 Test report	18
7.1 General	18
7.2 Reporting of test results	18
7.3 Choice of axis scaling	20
7.4 Presentation of test results	20
Annex A (normative) Calibration and corrections	21
Annex B (normative) Performing the test	24
Annex C (normative) Field report and G_{FDT} results	28
Annex D (normative) Accuracy and uncertainties	30
Bibliography	31

This is a preview of "BS EN ISO 22476-5:20...". Click here to purchase the full version from the ANSI store.

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 22476-5 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 22476 consists of the following parts, under the general title *Geotechnical investigation and testing — Field testing*:

- *Part 1: Electrical cone and piezocone penetration tests*
- *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 9: Field vane test*
- *Part 10: Weight sounding test* [Technical Specification]
- *Part 11: Flat dilatometer test* [Technical Specification]
- *Part 12: Mechanical cone penetration test (CPTM)*

This is a preview of "BS EN ISO 22476-5:20...". [Click here to purchase the full version from the ANSI store.](#)

Introduction

The results of dilatometer tests are used for deformation calculations provided that the range of stresses applied in the test are representative of the stresses to be applied by the proposed structure. Local experience normally improves the application of the results. In addition, for identification and classification of the ground, the results of sampling (according to ISO 22475-1) from each borehole are available for the evaluation of the tests. Identification and classification results (ISO 14688-1 and ISO 14689-1) are available from every separate ground layer within the desired investigation depth (see EN 1997-2:2007, 2.4.1.4(2)P, 4.1(1)P and 4.2.3(2)P).

This is a preview of "BS EN ISO 22476-5:20...". [Click here to purchase the full version from the ANSI store.](#)

This is a preview of "BS EN ISO 22476-5:20...". Click here to purchase the full version from the ANSI store.

Geotechnical investigation and testing — Field testing —

Part 5: Flexible dilatometer test

1 Scope

This part of ISO 22476 specifies the equipment requirements, execution of and reporting on flexible dilatometer tests.

NOTE This part of ISO 22476 fulfils the requirements for flexible dilatometer tests as part of geotechnical investigation and testing according to EN 1997-1 [1] and EN 1997-2 [2].

This part of ISO 22476 is applicable to tests in ground stiff enough not to be adversely affected by the drilling operation.

This part of ISO 22476 is applicable to four procedures for conducting a test with the flexible dilatometer.

This part of ISO 22476 applies to tests performed up to 1 800 m depth. Testing can be conducted either on land or off-shore.

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 amendments) applies.

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

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

EN 791, *Drill rigs — Safety*

EN 996, *Piling equipment — Safety requirements*

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

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

flexible dilatometer

cylindrical flexible probe which can be expanded by the application of hydraulic pressure or pressurized gas and which contains transducers for the measurement of the displacements of the flexible membrane and of the internal pressure