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Geotechnical investigation and testing - Testing of geotechnical structures - Part 5: Testing of grouted anchors (ISO 22477-5:2018)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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**Geotechnical investigation and testing - Testing of
geotechnical structures - Part 5: Testing of grouted
anchors (ISO 22477-5:2018)**

Reconnaissance et essais géotechniques - Essais des
structures géotechniques - Partie 5: Essais de tirants
d'ancrage (ISO 22477-5:2018)

Geotechnische Erkundung und Untersuchung - Prüfung
von geotechnischen Bauwerken und Bauwerksteilen -
Teil 5: Prüfung von Verpressankern (ISO 22477-
5:2018)

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EN ISO 22477-5:2018 (E)

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European foreword

This document (EN ISO 22477-5:2018) has been prepared by Technical Committee ISO/TC 182 "Geotechnics" in collaboration with Technical Committee CEN/TC 341 "Geotechnical Investigation and Testing" the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

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Endorsement notice

The text of ISO 22477-5:2018 has been approved by CEN as EN ISO 22477-5:2018 without any modification.

INTERNATIONAL STANDARD

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Geotechnical investigation and testing — Testing of geotechnical structures —

Part 5: Testing of grouted anchors

*Reconnaissance et essais géotechniques — Essais des structures
géotechniques —*

Partie 5: Essais de tirants d'ancrage



Reference number
ISO 22477-5:2018(E)

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 182, *Geotechnics*.

A list of all the parts in the ISO 22477 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO 22477-5:2018(E)**Introduction**

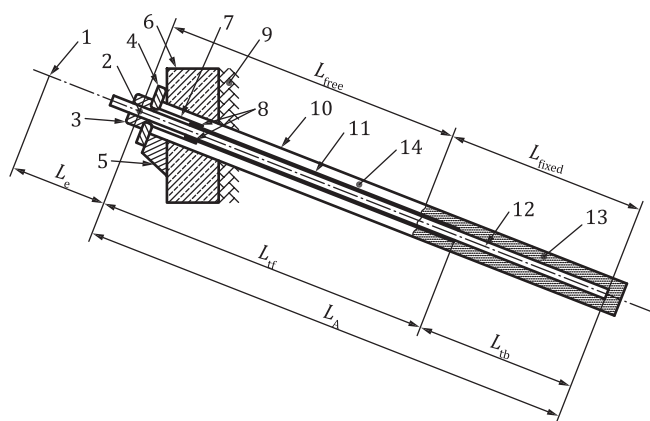
This document, together with EN 1997-1 and EN 1537, form the trinity in which:

- EN 1997-1 defines the design requirements for grouted anchors, including the limits of proof load and limiting criteria by testing of grouted anchors, which may be specified in the national annex (for EN 1997-1) or a similar national application document for ISO countries;
- EN 1537 defines the execution of grouted anchors;
- this document defines the testing of grouted anchors.

The document has been structured so that common items are given in [Clauses 1 to 7](#). The different test specific loading procedures, measurements, checks and presentation of test results for the three test methods (Test Method 1, 2 and 3) have been placed in three separate clauses. The determination of the fundamental characteristics: creep rate, load loss, critical creep load and the apparent tendon free length are not test specific and for this reason these have been placed in [Annexes A to D](#).

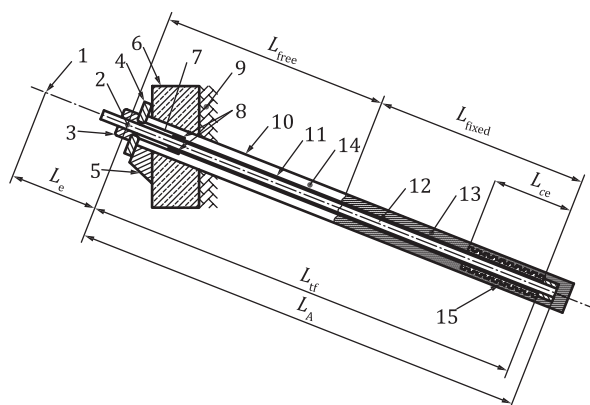
Yield stress and tensile strength for typical anchor steels appear in [Annex E](#).

[Figures 1 and 2](#) illustrate the two main types of grouted anchors considered in EN 1537.

**Key**

- 1 anchorage point at jack during stressing
- 2 anchorage point at anchor head in service
- 3 tensioning element at anchor head (nut or barrel and wedge)
- 4 bearing plate
- 5 load transfer block
- 6 structural element
- 7 trumpet or anchor head tube
- 8 O-ring
- 9 soil/rock
- 10 borehole
- 11 debonding sleeve
- 12 tendon
- 13 fixed length grout body
- 14 free length filling where appropriate

Figure 1 — Sketch of a bond type ground anchor — details of anchor head and head protection omitted

**Key**

- 1 anchorage point at jack during stressing
- 2 anchorage point at anchor head in service
- 3 tensioning element at anchor head (nut or barrel and wedge)
- 4 bearing plate
- 5 load transfer block
- 6 structural element
- 7 trumpet or anchor head tube
- 8 O-ring
- 9 soil/rock
- 10 borehole
- 11 debonding sleeve
- 12 tendon
- 13 fixed length grout body
- 14 free length filling where appropriate
- 15 compression element

Figure 2 — Sketch of a compression type ground anchor — details of anchor head and head protection omitted

Geotechnical investigation and testing — Testing of geotechnical structures —

Part 5: Testing of grouted anchors

1 Scope

This document establishes specifications for the execution of tension tests to be carried out on an anchor grouted in the ground, as defined in EN 1997-1 and EN 1537. Three methods of testing are recognized by this document. Test Method 1 involves cyclic tension loading with measurement of displacement at the load stages; Test Method 2 involves cyclic tension loading with measurement of load loss at the load stages; and Test Method 3 involves step-loading with measurement of displacement under successive maintained tension loads.

This document provides specifications for the experimental devices, the measurement apparatus, the test procedures, the definition and presentation of the test results and the content of records.

NOTE This document does not provide specification for the size of the proof load and the limiting criteria. These aspects reside in EN 1997-1 or its national annex for CEN countries and in similar national application documents for this test standard for ISO countries.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1537:2013, *Execution of special geotechnical works — Ground anchors*

EN 1997-1:2004+A1:2013, *Eurocode 7: Geotechnical design — Part 1: General rules*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN