
**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

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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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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.

Introduction

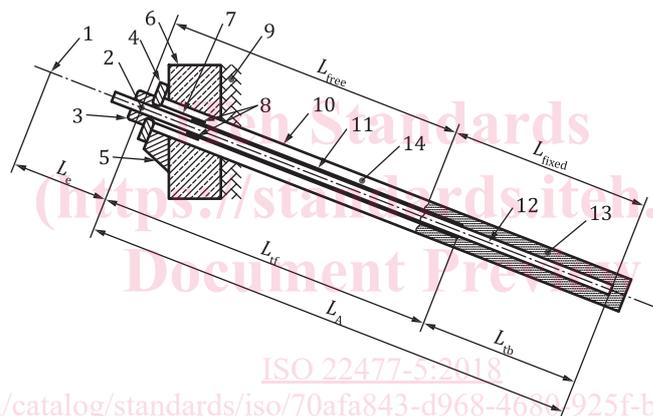
This document, together with EN 1997-1 and EN 1537, form the trinity in which:

- 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.



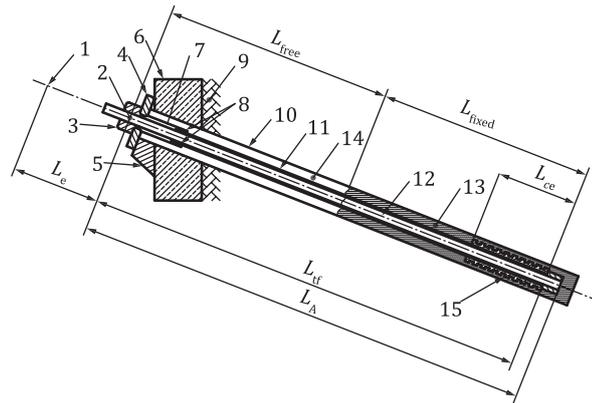
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Key

- 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)
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- 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

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