SLOVENSKI STANDARD
SIST EN ISO 18674-5:2019

01-december-2019

Geotehnično preiskovanje in preskušanje - Geotehnične meritve - 5. del: Merjenje sprememb napetosti s tlačnimi merskimi celicami (ISO 18674-5:2019)

Geotechnical investigation and testing - Geotechnical monitoring by field instrumentation - Part 5: Stress change measurements by total pressure cells (TPC) (ISO 18674-5:2019)

Geotechnische Erkundung und Untersuchung - Geotechnische Messungen - Teil 5: Spannungsänderungsmessungen mittels Druckmessdosen (ISO 18674 5:2019)

Reconnaissance et essais géotechniques - Surveillance géotechnique par instrumentation in situ - Partie 5: Mesures avec capteurs hydrauliques (ISO 18674-5:2019)

Ta slovenski standard je istoveten z: **EN ISO 18674-5:2019**

ICS:

13.080.20	Fizikalne lastnosti tal	Physical properties of soils
93.020	Zemeljska dela. Izkopavanja. Gradnja temeljev. Dela pod zemljo	Earthworks. Excavations. Foundation construction. Underground works

SIST EN ISO 18674-5:2019 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 18674-5

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ICS 13.080.20; 93.020

English Version

Geotechnical investigation and testing - Geotechnical monitoring by field instrumentation - Part 5: Stress change measurements by total pressure cells (TPC) (ISO 18674-5:2019)

Reconnaissance et essais géotechniques - Surveillance géotechnique par instrumentation in situ - Partie 5: Mesures avec capteurs hydrauliques (ISO 18674-5:2019)

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This European Standard was approved by CEN on 11 October 2019.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

This document (EN ISO 18674-5:2019) 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of an identical text or by endorsement, at the latest by April 2020, and conflicting national standards shall be withdrawn at the latest by April 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 18674-5:2019 has been approved by CEN as EN ISO 18674-5:2019 without any modification.

INTERNATIONAL STANDARD

ISO 18674-5

First edition
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Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation —

Part 5: Stress change measurements by total pressure cells (TPC)

Reconnaissance et essais géotechniques — Surveillance géotechnique par instrumentation in situ —

Partie 5: Mesures de la variation de pression par cellules de pression totale (TPC)

Reference number
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Contents

Page

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 of 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 www.iso.org/iso/foreword.html.

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

A list of all parts in the ISO 18674 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.

Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation —

Part 5: Stress change measurements by total pressure cells (TPC)

1 Scope

This document specifies the measurement of stress changes by means of total pressure cells (TPC). General rules of performance monitoring of the ground, of structures interacting with the ground, of geotechnical fills and of geotechnical works are presented in ISO 18674-1.

If applied in conjunction with ISO 18674-4, this document allows the determination of effective stress acting in the ground.

This document is applicable to:

— monitoring changes of the state of stress in the ground and in geo-engineered structures (e.g. in earth fill dams or tunnel lining);

— monitoring contact pressures at the interface between two media (e.g. earth pressure on retaining wall; contact pressure at the base of a foundation);

— checking geotechnical designs and adjustment of construction in connection with the Observational Design procedure;

— evaluating stability during or after construction.

Guidelines for the application of TPC in geotechnical engineering are presented in Annex B.

NOTE This document fulfils the requirements for the performance monitoring of the ground, of structures interacting with the ground and of geotechnical works by the means of total pressure cells as part of the geotechnical investigation and testing according to EN 1997-1[1] and EN 1997-2[2].

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

ISO 18674-1:2015, *Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation — Part 1: General rules*

ISO 18674-4, *Geotechnical investigation and testing — Geotechnical monitoring by field instrumentation — Part 4: Measurement of pore water pressure: Piezometer*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18674-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

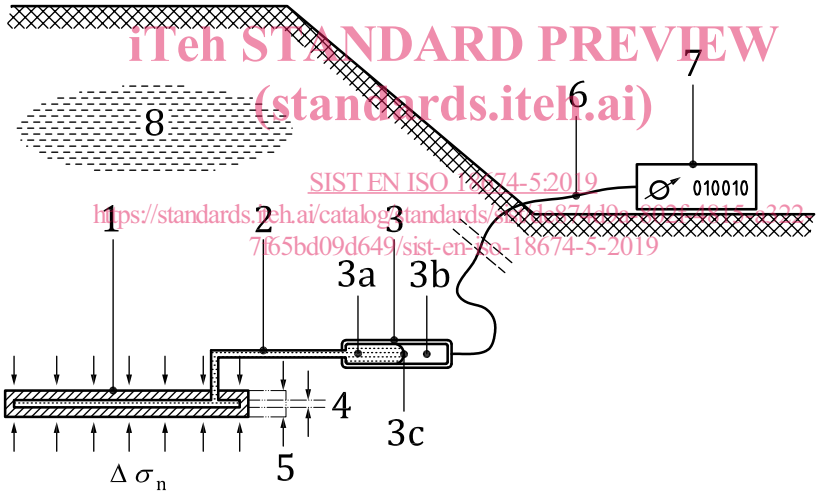
3.1
total pressure cell
TPC
field instrument for stress change measurements

Note 1 to entry: Typically, a total pressure cell system consists of a pressure compartment, a pressure tubing, a pressure measuring device, a measuring line and a control and readout unit (see Figure 1 and Reference [3]).

Note 2 to entry: The pressure compartment consists of two steel platens, welded together around their peripheries, where the intervening cavity is filled with a liquid. The cavity is connected to the inner chamber of a pressure measuring device via a liquid-filled pressure tubing. Inner and outer chambers of the pressure measuring device are separated by a flexible diaphragm.

Note 3 to entry: Total pressure cells are permanently installed either in fill or soft ground *(embedment pressure cells)* (3.2), in contact planes between any two media *(contact pressure cells)* (3.3) or in boreholes *(borehole pressure cells)* (3.4).

Note 4 to entry: The target of the measurement is the change of the total normal stress $\Delta\sigma_n$ of the medium acting onto the flat side of a pressure compartment (see 1 in Figure 1).



Key

1 pressure compartment
2 pressure tubing
3 pressure measuring device
  3a inner chamber
  3b outer chamber
  3c diaphragm
4 height of the cavity of the pressure compartment
5 height of the pressure compartment
6 measuring line (electric cable or twin hydraulic tubing)
7 control and readout unit
8 medium investigated

Figure 1 — Principal components of a TPC measuring system