SLOVENSKI STANDARD
SIST EN ISO 17628:2015

01-oktober-2015

Geotehnično preiskovanje in preskušanje - Geotermalno preskušanje - Ugotavljanje toplotne prevodnosti zemlje in skal z uporabo vrtine toplote (ISO 17628:2015)

Geotechnical investigation and testing - Geothermal testing - Determination of thermal conductivity of soil and rock using a borehole heat exchanger (ISO 17628:2015)

Geotechnische Erkundung und Untersuchung - Geothermische Versuche - Bestimmung der Wärmeleitfähigkeit von Boden und Fels unter Anwendung von Erdwärmesonden (ISO 17628:2015)

Reconnaissance et essais géotechniques - Essais géothermiques - Détermination de la conductivité thermique de sol et roche dans les sondes géothermiques (ISO 17628:2015)

Ta slovenski standard je istoveten z: **EN ISO 17628:2015**

ICS:

27.190	Biološki viri in drugi alternativni viri energije	Biological sources and alternative sources of energy
93.020	Zemeljska dela. Izkopavanja. Gradnja temeljev. Dela pod zemljo	Earthworks. Excavations. Foundation construction. Underground works

SIST EN ISO 17628:2015 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 17628

July 2015

ICS 93.020; 13.080.20

English Version

Geotechnical investigation and testing - Geothermal testing - Determination of thermal conductivity of soil and rock using a borehole heat exchanger (ISO 17628:2015)

Reconnaissance et essais géotechniques - Essais géothermiques - Détermination de la conductivité thermique des sols et des roches dans les sondes géothermiques (ISO 17628:2015)

Geotechnische Erkundung und Untersuchung - Geothermische Versuche - Bestimmung der Wärmeleitfähigkeit von Boden und Fels unter Anwendung von Erdwärmesonden (ISO 17628:2015)

This European Standard was approved by CEN on 23 April 2015.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN ISO 17628:2015) has been prepared by Technical Committee CEN/TC 341 “Geotechnical Investigation and Testing”, the secretariat of which is held by BSI, 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 January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

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.

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Endorsement notice

The text of ISO 17628:2015 has been approved by CEN as EN ISO 17628:2015 without any modification.

INTERNATIONAL STANDARD

ISO 17628

First edition
2015-07-15

Geotechnical investigation and testing — Geothermal testing — Determination of thermal conductivity of soil and rock using a borehole heat exchanger

Reconnaissance et essais géotechniques — Essais géothermiques — Détermination de la conductivité thermique des sols et des roches dans les sondes géothermiques

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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

ISO 17628 was prepared by European Committee for Standardization (CEN) Technical Committee CEN/TC 341, *Geotechnical investigation and testing*, in collaboration with ISO Technical Committee ISO/TC 182, *Geotechnics*, Subcommittee SC 1, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Geotechnical investigation and testing — Geothermal testing — Determination of thermal conductivity of soil and rock using a borehole heat exchanger

1 Scope

This International Standard specifies requirements for the Geothermal Response Test (GRT). This test comprises the *in situ* determination of the thermal conductivity in saturated and unsaturated soil and rock in a heat exchanger installed in a borehole. For this test, liquid heat transfer media not subjected to phase changes are used.

The thermal conductivity is an important parameter used in the design of thermal storage and thermal exchange systems.

A Geothermal Response Test measures the temperature response to a thermal energy forcing of a borehole heat exchanger (BHE) or the extraction of thermal energy from a borehole. The temperature response is related to the thermal parameters of the ground and borehole filling material, such as thermal conductivity and borehole resistivity, and is therefore used to obtain estimated or derived values of these parameters.

This International Standard applies to heat exchangers installed in vertical or inclined boreholes with length up to e.g. 400 m and with a diameter of up to 200 mm.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 16228-1, *Drilling and foundation equipment - Safety - Part 1: Common requirements*

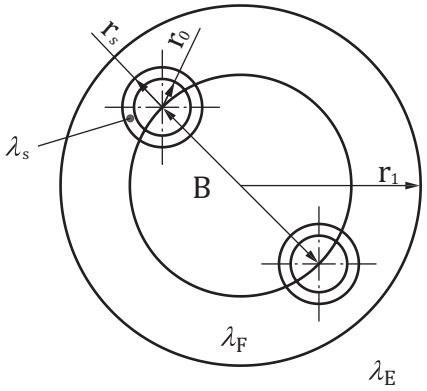
EN 16228-2, *Drilling and foundation equipment - Safety - Part 2: Mobile drill rigs for civil and geotechnical engineering, quarrying and mining*

3 Terms and definitions

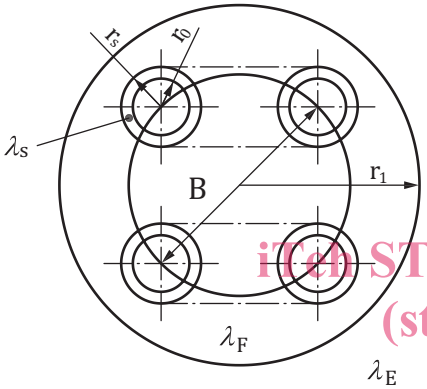
For the purposes of this document, the terms and definitions given in ISO 22475-1 and the following apply.

3.1
borehole heat exchanger
BHE
one or two U-tubes or one coaxial tube in a borehole through which the exchanger fluid circulates

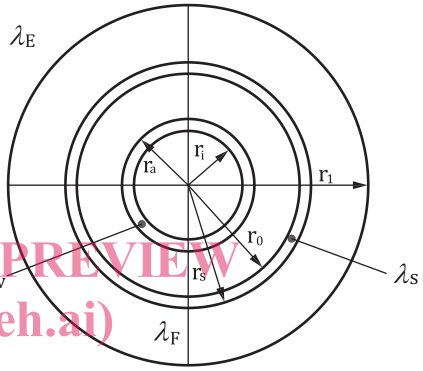
Note 1 to entry: See Figure 1 and Figure 2.



a) single U-tube



b) double U-tube



c) coaxial tube

Key

r_1	borehole radius	λ_F	thermal conductivity of the annular space filling
r_i	inner radius	λ_w	thermal conductivity of the inner borehole tube
r_a	outer radius	λ_s	thermal conductivity of the outer borehole tube
r_o	inner radius of the outer tube	λ_E	thermal conductivity of the ground
r_s	outer radius of the outer tube	B	tube spacing

Figure 1 — Cross-section of examples of borehole heat exchanger tubes