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Drilling and foundation equipment - Safety - Part 7: Interchangeable auxiliary equipment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16228-7:2014+A1:2021 sisaldab Euroopa standardi EN 16228-7:2014+A1:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 16228-7:2014+A1:2021 consists of the English text of the European standard EN 16228-7:2014+A1:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.12.2021.	Date of Availability of the European standard is 22.12.2021.
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ICS 93.020

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16228-7:2014+A1

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ICS 93.020

Supersedes EN 16228-7:2014

English Version

Drilling and foundation equipment - Safety - Part 7: Interchangeable auxiliary equipment

Machines de forage et de fondation - Sécurité - Partie 7 : Équipements complémentaires interchangeables

Geräte für Bohr- und Gründungsarbeiten - Sicherheit - Teil 7: Auswechselbare Zusatzausrüstungen

This European Standard was approved by CEN on 6 March 2014 and includes Amendment 1 approved by CEN on 22 November 2021.

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European foreword

This document (EN 16228-7:2014+A1:2021) has been prepared by Technical Committee CEN/TC 151 “Construction equipment and building material machines - Safety”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2022 and conflicting national standards shall be withdrawn at the latest by June 2022.

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.

This document supersedes [A1] EN 16228-7:2014 [A1].

This document includes Amendment 1 approved by CEN on 22 November 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] [A1].

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is divided into several parts and covers drilling and foundation equipment.

Part 1 contains requirements that are/may be common to all drilling and foundation equipment. Other parts contain additional requirements for specific machines that supplement or modify the requirements of part 1. Compliance with the clauses of part 1 together with those of a relevant specific part of this standard giving requirements for a particular machine provides one means of conforming with the essential health and safety requirements of the Directive concerned.

When a relevant specific part does not exist, part 1 can help to establish the requirements for the machine, but will not by itself provide a means of conforming to the relevant essential health and safety requirements of the Directive.

This European Standard, EN 16228, *Drillling and foundation equipment – Safety*, consists of the following parts:

— *Part 1: Common requirements*

— [A1] *Part 2: Mobile drill rigs for civil and geotechnical engineering in soil or soil and rock mixture* [A1]

— *Part 3: Horizontal directional drilling equipment (HDD)*

— *Part 4: Foundation equipment*

— *Part 5: Diaphragm walling equipment*

— *Part 6: Jetting, grouting and injection equipment*

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— *Part 7: Interchangeable auxiliary equipment*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for drilling and foundation equipment that have been designed and built according to the provisions of this type C standard.

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1 Scope

This European Standard, together with part 1, deals with all significant hazards for interchangeable auxiliary equipment when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer associated with the whole life time of the machine (see Clause 4).

The requirements of this part are complementary to the common requirements formulated in ▌A1⟩ EN 16228-1:2014+A1:2021 ⟨A1▐.

This document does not repeat the requirements from ▌A1⟩ EN 16228-1:2014+A1:2021 ⟨A1▐, but adds or replaces the requirements for application for interchangeable auxiliary equipment.

This document specifies the specific safety requirements for interchangeable auxiliary equipment to be used in drilling and foundation operations, connected with drilling and foundation equipment, agricultural equipment and/or earth moving machinery when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer.

Interchangeable auxiliary equipment includes pile installation and extraction equipment, impact hammers, extractors, vibrators, deep vibrators, static pile pushing/pulling devices, rotary percussion hammers, rotary drilling drives, drill mast equipment such as leaders equipped with a drill stem and gears attached to the boom of an excavator and casing oscillators/rotators.

Diaphragm wall cutting tools are dealt with in ▌A1⟩ EN 16228-5:2014+A1:2021 ⟨A1▐.

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.

▌A1⟩ EN 16228-1:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — Part 1: General requirements*

▌A1⟩ EN 16228-2:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — /A1⟩ Part 2: Mobile drill rigs for civil and geotechnical engineering in soil or soil and rock mixture ⟨A1/*

▌A1⟩ EN 16228-3:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — Part 3: Horizontal directional drilling equipment (HDD)*

▌A1⟩ EN 16228-4:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — Part 4: Foundation equipment*

▌A1⟩ EN 16228-5:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — Part 5: Diaphragm walling equipment*

▌A1⟩ EN 16228-6:2014+A1:2021 ⟨A1▐, *Drilling and foundation equipment — Safety — Part 6: Jetting, grouting and injection equipment*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

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EN ISO 11203:2009, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, ⟦A1⟩ EN 16228-1:2014+A1:2021 ⟨A1⟧ and the following apply.

NOTE Examples are given in Annex A of ⟦A1⟩ EN 16228–1:2014+A1:2021 ⟨A1⟧.

3.1
rotary percussion hammers
equipment to drill holes into the ground, where the rotary drive has an additional impact hammer

Note 1 to entry: The rotary percussion hammer can be mounted at the end of the drill stem outside the hole on the leader of the drilling and foundation equipment. The range of the impact frequencies is usually between 20 Hz and 60 Hz.

3.2
down the hole hammers (DTH-hammers)
device in which the percussion mechanism is located directly behind the drill bit

Note 1 to entry: The drill pipes transmit the necessary feed force and rotation to hammer and bit plus compressed air or fluids for the hammer and flushing of cuttings. The drill pipes are added to the drill string successively behind the hammer as the hole gets deeper. The hammer piston strikes the impact surface of the bit directly, while the hammer casing gives straight and stable guidance of the drill bit. This means that the impact energy does not have to pass through any joints at all. The impact energy therefore is not lost in joints allowing for much deeper percussion drilling.

3.3
impact hammer
leader-guided or free-riding equipment to drive pile-elements by high-force striking action into the ground

Note 1 to entry: The equipment can be actuated by hydraulic or pneumatic energy, or by internal combustion, e.g. diesel hammer or a free falling weight lifted by a winch.

3.4
static pile pushing/pulling device
equipment to push or pull piles, mostly sheet piles, into or out of the ground or vice versa, by static pushing pulling forces, which are commonly actuated by hydraulic energy

Note 1 to entry: The equipment is fastened via clamps to more than one pile and is pushing/pulling one pile with the actuator und using the other clamps as thrust bearing. This equipment can be mounted on a leader of a drilling and foundation equipment or can be self-riding on top of the piles.

3.5
sonic drilling device
equipment which superposes rotary drilling with vibrations at a high frequency

Note 1 to entry: The vibrations are mostly generated within the drill head and can be controlled by the operator to suit the specific conditions of the soil/rock geology. Resonance magnifies the amplitude of the drill bit, which

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