SLOVENSKI STANDARD
SIST EN 16228-1:2014/oprA1:2019

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Oprema za vrtanje in temeljenje - Varnost - 1. del: Splošne zahteve - Dopolnilo A1

Drilling and foundation equipment - Safety - Part 1: Common requirements

Geräte für Bohr- und Gründungsarbeiten - Sicherheit - Teil 1: Gemeinsame Anforderungen

Machines de forage et de fondation - Sécurité - Partie 1 : Prescriptions générales

Ta slovenski standard je istoveten z: **EN 16228-1:2014/prA1**

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93.020	Zemeljska dela. Izkopavanja. Gradnja temeljev. Dela pod zemljo	Earthworks. Excavations. Foundation construction. Underground works

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Drilling and foundation equipment - Safety - Part 1: Common requirements

Machines de forage et de fondation - Sécurité - Partie 1 : Prescriptions générales

Geräte für Bohr- und Gründungsarbeiten - Sicherheit - Teil 1: Gemeinsame Anforderungen

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 151.

This draft amendment A1, if approved, will modify the European Standard EN 16228-1:2014. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (EN 16228-1:2014/prA1:2019) 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 document is currently submitted to the CEN Enquiry.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of EN 16228-1:2014.

1 Modification to the whole text

In the entire document, for all instances found, replace "EN 16228-1:2014" *with* "EN 16228-1:2014+prA1:2019".

2 Modification to Clause 1, Scope

In the fifth paragraph, last sentence delete the final punctuation of the third item and add the following text:

";

— core drilling machines on sIn tand covered by EN 12348;

— hand-held machine (in particular machines covered by ISO 11148-5"

In the sixth paragraph, first sentence, replace "will conform to the requirements specified in this drilling and foundation equipment" *with* "is covered by this".

3 Modification to Clause 2, Normative references

Replace "EN 953" *with* "EN ISO 14120:2015".

Add the following references:

"EN 614-1:2006+A1:2009, *Ergonomic design principles — Part 1: Terminology and general principles*

EN 894-3:2000+A1:2008, *Ergonomic requirements for the design of displays and control actuators – Part 3: Control actuators*"

EN IEC 61000 6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments*

EN IEC 61000 6-4, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments*

prEN ISO 13766-1, *Construction machinery - Electromagnetic compatibility of machines with internal electrical power supply — Part 1: General EMC requirements under typical EMC environmental conditions*

prEN ISO 13766-2, *Construction machinery - Electromagnetic compatibility of machines with internal electrical power supply — Part 1: General EMC requirements under typical EMC environmental conditions*

4 Modification to Clause 3, Terms and definitions

In definition 3.17 (assistant), d*elete* "operation"; r*eplace* "assists with the" *by* "is intended to make operation during the use of some".

Add the following NOTE to definition 3.17:

"Note 1 to Entry The assistant operator could be exposed to moving parts involved in the drilling process without having the control on the said mobile elements."

After definition 3.19 (operator), add the following NOTE:

"Note 2 to entry: The operator can also be the maintenance technician of the rig."

After the last definition 3.38, add the following new definitions:

"

3.39
geometric protection zone
volume within which, in case of a rolling-over or tilting-over of the rig, the cabin is located to be safe from major deformations

3.40
supplementary trip device
sensitive protective equipment intended to detect the touch of a person or body part of a person (mechanically or electro sensitive activated trip) and which can also act as impeding device

Note 1 to entry: This device is aimed at reducing severity of the accident, in addition to the other protective devices intended to reduce the occurrences of accidents.

[SOURCE: ISO 13856-3:2013(en), 3.1 modified]

3.41
TAG based system
system, e.g. RFID or industrial radar, capable of detecting any person (e.g. operator and assistant) carrying a TAG, i.e. a localisation device

3.42
integral mechanised tool handling system
mechanised handling system installed on the machine allowing transfer of rods and/or tools to the drill axis and vice versa

Note 1 to entry: The mechanised tool handling system can be a carousel, a magazine, a robot arm, etc.

3.43
integral lifting device for drilling tools
manually operated lifting device installed on the machine, allowing transfer of rods and/or tools to the drill axis and vice versa

Note 1 to entry: A pivoting rotary head with a chuck or a travelling block either with an elevator, lifting cap, pulling out flange, lifting sling or similar is considered a lifting device.

3.44
external mechanised tool handling system
mechanised handling system for rods and/or tools that is not part of the drilling rig, allowing the transfer of the rods and/or tools to the drill axis and vice versa

Note 1 to entry: An external mechanised tool handling system is interchangeable equipment fitted on a carrier e.g. an excavator.

Note 2 to entry: An external mechanised tool handling system can be operated by the assistant and it has its own operator's panel.

3.45
communication connection port for external mechanised tool handling systems
connection port located on the drilling rig that interfaces with the communication device between an external mechanised tool handling system and the drilling rig

3.46
communication device
device designed to be plugged into the communication connection port to provide the communication between an external mechanised tool handling system and the drilling rig

Note 1 to entry: The communication device can be e.g. a wireless or a cable connection.

Note 2 to entry: The manufacturer of this device cannot be the manufacturer of the drilling rig."

5 Modification to Clause 4, List of additional significant hazards

Replace Table 1 by the following:

Table 1 — List of significant hazards and associated requirements

No.	Hazard	Relevant clause(s) in this document
1	Mechanical hazards	
1.1	Generated by machine parts or work pieces, e.g. by:	
1.1.1	Shape	5.11, 5.12, 5.14, 5.22
1.1.2	Mass and stability	5.2.1, 5.2.3, 5.10.1, 5.10.2, Annex F
1.1.3	Mass and velocity	5.2.1, 5.2.3.4
1.1.4	Inadequacy of mechanical strength	5.2.2
1.2	Accumulation of energy inside the machinery, e.g. by:	
1.2.1	Fluids under pressure	5.4.1, 5.4.2, 5.4.3, 7.3.2
1.2.2	Live parts under voltage	5.3, 5.21, 7.3.2
1.3	Elementary forms of mechanical hazards	
1.3.1	Crushing	5.7, 5.8, 5.9, 5.12, 5.23, 7.2.2, 7.2.3
1.3.2	Shearing	5.7, 5.8, 5.9, 5.12, 5.23, 7.2.2, 7.2.3
1.3.3	Cutting or severing	5.8, 5.9, 5.12, 5.23, 7.2.2, 7.2.3
1.3.4	Entanglement hazard	5.9, 5.23
1.3.5	Drawing-in or trapping hazard moving transmission parts	5.23 5.23.3
1.3.6	Stabbing or puncture hazard	5.20
1.3.7	High pressure fluid injection or ejection hazard	5.4.1, 5.4.3

No.	Hazard	Relevant clause(s) in this document
2	Electrical hazards due to:	
2.1	Contact of persons with live parts (direct contact)	5.3.1
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	5.3.1
2.3	Approach to live parts under high voltage	5.3.1
2.4	Thermal radiation or other phenomena such as the projection of molten particles and chemical effects from short-circuits, overloads, etc.	5.3.2
3	Thermal hazards, resulting in:	
3.1	Burns and scalds, by possible contact of persons with objects or materials with an extreme temperature, by flames, by radiation, etc.	5.22
3.2	Hot or cold working environment	5.14.1
4	Hazards generated by noise, resulting in:	
4.1	Hearing losses and physiological disorders	5.14.1, 5.27, Annex B
4.2	Accidents due to interference with speech communication and warning signals	5.27, Annex B
5	Hazards generated by vibration	
5.1	Whole-body vibration, particularly when combined with poor postures	5.14.1, 5.27.3, Annex C
6	Processed materials and substances, used materials, fuels	
6.1	Hazards from contact with harmful fluids, gases, mists, fumes and dusts	5.3.2, 5.14, 5.28
6.2	Fire or explosion hazard	5.26, 5.28, 5.3.2
7	Neglected ergonomic principles in machine design e.g. hazards from:	
7.1	Unhealthy postures or excessive efforts	5.11, 5.14.1
7.2	Inadequate consideration of hand-arm or foot-leg anatomy	5.14
7.3	Neglected use of personal protection equipment	5.11, 5.13, 5.14
7.4	Inadequate local lighting	5.25
7.5	Mental overload or underload, stress	5.11, 5.14.1
7.6	Human errors, human behaviour	5.11, 5.14.1
7.7	Inadequate design, location or identification of manual controls	5.11, 5.14.1
7.8	Inadequate design or location of visual display units	5.11, 5.14.1
8	Combination of hazards	5.18, 5.23.2.2, 5.23.5, 5.23.6, 5.29, 7.2.2
9	Unexpected start-up, unexpected overrun/overspeed (or any similar malfunction) from:	
9.1	Failure/disorder of control system	5.15, 5.17, 5.18

No.	Hazard	Relevant clause(s) in this document
9.2	Restoration of energy supply after an interruption	5.5, 5.15
9.3	External influences on electrical equipment	5.3.1
9.4	Other external influences (gravity, wind, etc.)	5.2
9.5	Errors in the software	5.15
9.6	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities)	5.14.1
9.7	Electromagnetic disturbances	5.3.3
10	Impossibility of stopping the device in the best possible conditions	5.5, 5.6, 5.15
10.1	Control that can accidentally initiate dangerous movements	5.15.4, 5.16, 5.17, 5.18
11	Failure of the power supply	5.5, 5.6
12	Failure of the control circuit	5.15
13	Errors of fitting	5.9, 7.3
14	Break-up during operation	5.2, 7.3
15	Falling or ejected object or fluid	5.4.3, 5.14.1, 5.24
16	Loss of stability/overturning of machinery	5.2.3
17	Slip, trip and falling of persons (related to machinery)	5.12
18	Electromagnetic radiation	5.3.3
Additional hazards, hazardous situations and hazardous events due to mobility		
18	Relating to the travelling function	
18.1	Uncontrolled movement of machine when starting the engine	5.6
18.2	Movement without an operator at the driving position	5.15, 5.16.1
18.3	Insufficient ability of machinery to be slowed down, stopped and immobilised	5.6, 5.7
19	Linked to the work position (including driving station) on the machine	
19.1	Fall of persons during access to (or at/from) the work position	5.12
19.2	Exhaust gases/lack of oxygen at the work position	5.14.1, 5.28
19.3	Fire (flammability of the cab, lack of extinguishing means)	5.26
19.4	Mechanical hazards at the work position contact with the wheels/crawlers; fall of objects, penetration by object.	5.14.1, 5.23 5.24
19.5	Insufficient visibility from the working position	5.14.2
19.6	Inadequate lighting	5.25
19.7	Inadequate seating	5.14.1
19.8	Noise at the driving position	5.14.1, 5.27.2, Annex B

No.	Hazard	Relevant clause(s) in this document
19.9	Vibration at the driving position	5.14.1, 5.27.3, Annex C
19.10	Insufficient means of evacuation/emergency exit	5.14.1
20	Due to the control system	
20.1	Inadequate location of controls/control devices	5.16
20.2	Inadequate design of the actuation mode and/or action mode of controls	5.15, 5.16
21	From handling the machine (lack of stability)	5.2, 5.19, 7.3
22	Due to the power source and to the transmission of power	
22.1	Hazards from the engine and the batteries	5.3.2, 5.15, 5.23.3
22.2	Hazards from coupling and towing	5.19
23	From/to third persons	
23.1	Unauthorized start	5.13.3, 5.15.3
23.2	Drift of a part, away from its stopping position	5.4.1, 5.5, 5.6, 5.7, 5.8
23.3	Lack or inadequacy of visual or acoustic warning means	5.30
24	Insufficient instructions for the driver/operator	7.3.2
Additional hazards, hazardous situations and hazardous events due to lifting		
25	Mechanical hazards and events	
25.1	From load falls, collision, machine tipping caused by:	
25.1.1	Lack of stability	5.2.3, 5.8.2, 5.10, 7.3.2
25.1.2	Uncontrolled loading; overloading; overturning moment exceeded	5.6, 5.8.2, 5.9, 5.10, 7.3.2
25.1.3	Uncontrolled amplitude of movements	5.5, 5.6, 5.8.2, 5.10, 7.3.2
25.1.4	Unexpected/unintended movement of loads	5.5, 5.6, 5.8.2, 7.3.2
25.1.5	Inadequate holding devices/accessories	5.8.2, 5.9, 7.3.2, 7.3.3
25.1.6	Collision of more than one machine	5.7
25.2	From access of persons to load support	7.3.2
25.3	From insufficient mechanical strength of parts	5.2, 5.9
25.4	From inadequate design of pulleys, drums	5.8.2, 5.8.3
25.5	From inadequate selection/integration into the machine of chains, ropes, lifting accessories	5.8.3, 5.8.4, 5.8.5, Annex E
25.6	From lowering of the load by friction brake	5.8.2
25.7	From abnormal conditions of assembly/testing/use/maintenance	6.1, 6.2, 7.3.3
25.8	Load-person interference (impact by load)	7.3.2
26	Electrical hazards	5.3, 5.5
27	Hazards generated by neglecting ergonomic principles	
27.1	Insufficient visibility from the driving position	5.14.2
Additional hazards, hazardous situations and hazardous events due to lifting of persons		

No.	Hazard	Relevant clause(s) in this document
28	Mechanical hazards and hazardous events due to:	
28.1	Inadequate working coefficients	5.13.2, 5.13.3
28.2	Failing of load control	5.8.2, 5.13.2
28.3	Failing of controls at working platform for lifting personnel (function, priority)	5.13.2
28.4	Overspeed of working platform for lifting personnel	5.13.2
29	Falling of person from the working platform for lifting personnel	5.13.2
30	From derailment of the working platform for lifting personnel	5.13.2

6 Modification to 5.2.3.4.4, Wind load

Delete first indent and its related sub-indent.

After the enumeration, before the last paragraph, add the following indent:

“

— for all other operating conditions:

— $P = 0,25\,kPa \times \left(250\,N/m^2\right)$;”

In the last paragraph, first sentence, after the text “The direction of the wind load”, *add* “, if any, “.

7 Modification to 5.2.3.4.5, Dynamic loads

In the fourth paragraph, first and second sentence, replace “equal to the weight of the released mass. It is applicable to equipment” *with* “that shall be calculated considering the application and the structure of the equipment”.

After "chisel, hammer grab, rope grab, etc.", *add* "or on the basis of a default value of 30 % of the released mass”.

8 Modification to 5.2.3.4.7, Working loads

In the first paragraph, third indent, after the text “pushing or feed load that may cause a backward overturning.”, *add the following new sentence:*

“The maximum permissible values shall be given in the operator's manual, see Clause 7.”