



**NSAI**  
Standards

Irish Standard  
I.S. EN 16228-2:2014

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

**I.S. EN 16228-2:2014**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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

Machines de forage et de fondation - Sécurité - Partie 2:  
Machines mobiles de forage de génie civil, de  
géotechnique, de forage d'eau, d'exploration de sol,  
d'énergie géothermique, de mines et carrières

Geräte für Bohr- und Gründungsarbeiten - Sicherheit - Teil  
2: Mobile Bohrgeräte für Tiefbau, Geotechnik und  
Gewinnung

This European Standard was approved by CEN on 6 March 2014.

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<b>Contents</b>	<b>Page</b>
<b>Foreword</b> .....	<b>4</b>
<b>Introduction</b> .....	<b>5</b>
<b>1 Scope</b> .....	<b>6</b>
<b>2 Normative references</b> .....	<b>6</b>
<b>3 Terms and definitions</b> .....	<b>7</b>
<b>4 List of additional significant hazards</b> .....	<b>8</b>
<b>5 Safety requirements and/or protective measures</b> .....	<b>9</b>
5.1 General.....	9
5.2 Boom mounted working platforms for underground use .....	9
5.3 Requirements for strength and stability .....	10
5.3.1 Stability calculation - Tipping angle .....	10
5.3.2 Operating conditions.....	10
5.4 Fire protection.....	11
5.5 Guards .....	11
5.6 Protection against moving parts on specific machine types.....	12
5.6.1 General.....	12
5.6.2 Underground pre-armouring machine.....	12
5.6.3 Drill jumbo .....	12
5.7 Rod/auger guide.....	13
5.8 Winches, draw-works and ropes for movement on slopes .....	13
5.9 Operating position(s) .....	14
5.10 Brakes of the carrier machine .....	14
5.10.1 General.....	14
5.10.2 General requirements for wheel mounted mobile drill rigs .....	15
5.10.3 Service braking system for wheel mounted mobile drill rigs .....	15
5.10.4 Secondary braking system for wheel mounted mobile drill rigs.....	15
5.10.5 Parking braking system for rubber-tyred rigs .....	15
5.10.6 Verification of brakes .....	16
5.10.7 Braking systems for skid steer wheel mounted drill rigs.....	16
<b>6 Verification of the safety requirements and/or protective measures</b> .....	<b>16</b>
6.1 General.....	16
6.2 Functional test .....	18
<b>7 Information for use</b> .....	<b>18</b>
7.1 General.....	18
7.2 Drill rigs for underground operation.....	18
<b>Annex A (normative) Noise test code</b> .....	<b>20</b>
A.1 General.....	20
A.2 Non-Percussive mobile drill rigs (Rotary Drilling) .....	20
A.3 Percussive mobile drill rigs (Percussive and Rotary-percussive) .....	20
A.4 Information to be recorded and reported .....	20
<b>Annex B (normative) Brake test for mobile drill rigs excluding truck and tractor mounted drill rigs</b> ....	<b>21</b>
B.1 Test conditions .....	21
B.2 Performance of the tests.....	21

<b>B.3</b>	<b>Dynamic tests for wheel mounted mobile drill rigs .....</b>	<b>22</b>
<b>B.4</b>	<b>Service brake test.....</b>	<b>22</b>
<b>B.5</b>	<b>Heat fade test .....</b>	<b>22</b>
<b>B.6</b>	<b>Secondary brake test .....</b>	<b>22</b>
<b>B.7</b>	<b>Parking brake test .....</b>	<b>22</b>
<b>B.8</b>	<b>Test report.....</b>	<b>23</b>
<b>Annex ZA (informative)</b>	<b>Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC .....</b>	<b>24</b>
<b>Bibliography.....</b>		<b>25</b>

**EN 16228-2:2014 (E)****Foreword**

This document (EN 16228-2:2014) 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 November 2014 and conflicting national standards shall be withdrawn at the latest by November 2014.

This document supersedes EN 791:1995+A1:2009 and EN 996:1995+A3:2009.

This document has been prepared under a mandate 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 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, *Drilling and foundation equipment – Safety*, consists of the following parts:

- *Part 1: Common requirements*
- *Part 2: Mobile drill rigs for civil and geotechnical engineering, quarrying and mining*
- *Part 3: Horizontal directional drilling equipment (HDD)*
- *Part 4: Foundation equipment*
- *Part 5: Diaphragm walling equipment*
- *Part 6: Jetting, grouting and injection equipment*
- *Part 7: Interchangeable auxiliary equipment*

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

## **Introduction**

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

The machinery concerned and the extent to which hazards, hazardous situation and events are covered are indicated in the scope of this document.

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 machines that have been designed and built according to the provisions of this type C standard.

**EN 16228-2:2014 (E)****1 Scope**

This European Standard, together with part 1, deals with all significant hazards for mobile drill rigs for civil and geotechnical engineering, quarrying and mining 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 EN 16228-1:2014.

This document does not repeat the requirements from EN 16228-1, but adds or replaces the requirements for application for mobile drill rigs.

In this document the general term “mobile drill rig” covers several different types of machines for use in:

- civil engineering;
- geotechnical engineering (including ground investigation, anchoring, soil nailing, mini-piling, ground stabilization, grouting);
- water well drilling;
- geothermal installations;
- landfill drilling;
- underpinning, tunnelling, mining and quarrying;
- for use above ground as well as underground.

Typically, the process of drilling involves the addition of drill rods, tubes, casings or augers etc., normally threaded, as the borehole extends to depth.

NOTE 1 For machines with torque greater than 35 kNm see EN 16228–4 initially.

NOTE 2 The term “drill rigs” includes rigs with a separate power pack supplied by the rig manufacturer.

**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.

EN 280:2013, *Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests*

EN 16228-1:2014, *Drilling and foundation equipment — Safety — Part 1: Common requirements*

EN ISO 3449:2008, *Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements (ISO 3449:2005)*

EN ISO 3450:2011, *Earth-moving machinery - Wheeled or high-speed rubber-tracked machines - Performance requirements and test procedures for brake systems (ISO 3450:2011)*

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



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