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**Mining — Vocabulary —**  
**Part 5:**  
**Drilling and blasting**

*Exploitation minière — Vocabulaire —*  
*Partie 5: Forage et abattage à l'explosif*

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Published in Switzerland

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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](http://www.iso.org/directives)).

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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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 82, *Mining*.

A list of all parts in the ISO 22932 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](http://www.iso.org/members.html).

## Introduction

The ISO 22932 series has been prepared in order to standardize and to co-ordinate the global use of technical terms and definitions in mining, for the benefit of the experts working on different types of mining activities.

The need for the ISO 22932 series arose from the widely varying interpretation of terms used within the industry and the prevalent use of more than one synonym.

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# Mining — Vocabulary —

## Part 5: Drilling and blasting

### 1 Scope

This document specifies the drilling and blasting terms commonly used in mining. Only those terms that have a specific meaning in this field are included.

### 2 Normative references

This document does not contain normative references.

### 3 Terms and definitions

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

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

— IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1 Rock drilling concepts

**3.1.1 back-reaming**  
enlargement of a bore by pulling back a tool of a larger diameter than that previously used to form the bore

**3.1.2 bench drilling**  
*drilling (3.1.11) of blast holes (3.3.2) on benches (3.3.1) in open pit mines*

**3.1.3 blast hole drilling**  
*drilling (3.1.11) of holes to be charged with explosive (3.25.1.4) for blasting (3.30.1.1)*

**3.1.4 consolidation drilling**  
*drilling (3.1.11) of long holes in the front or at an angle of the drift direction to be injected with consolidation fluid*

EXAMPLE *Grout (3.15.4).*

**3.1.5 coverage area**  
area that the rock drill can drill from one stationary position of the *rock drill rig (3.8.15)*

Note 1 to entry: The coverage area depends largely on the *boom (3.13.11)* configuration and if of the rock drill rig, and if there is a turn able superstructure.

Note 2 to entry: *Hole deviation (3.4.8)* is due to the *drill bit (3.11.1)* changing direction as a result of, for example, inhomogeneity in the rock or a bent *drill rod (3.13.2)* is bent. *Hole deviation (3.4.8)* can be minimised by sturdy *drill string (3.13.1)* support and proper guidance while *collaring (3.3.3)*.

### 3.1.6

#### **dimensional stone drilling**

*drilling* (3.1.11) of holes for quarrying natural stone

### 3.1.7

#### **drainage drilling**

*drilling* (3.1.11) of drainage holes for methane or water

### 3.1.8

#### **drifting**

*drilling* (3.1.11), *blasting* (3.30.1.1) and excavating rock to create *transportation* (3.16.16) and access openings to ore bodies in an underground mining operation

### 3.1.9

#### **drill instruction**

instruction for how *drilling* (3.1.11) should be carried out

### 3.1.10

#### **drillability**

relative speed at which a material may be penetrated by a *drill bit* (3.11.1)

Note 1 to entry: High drillability denotes easy penetration at a fast rate.

[SOURCE: Reference [2]]

### 3.1.11

#### **drilling**

process by which a borehole is produced in any geological formation by rotary, rotary percussive, percussive or thrust methods and in any predetermined direction in relation to the drill rig

[SOURCE: ISO 22475-1:2021, 3.1.5]

### 3.1.12

#### **drilling for secondary breaking**

*drilling* (3.1.11) of *blast holes* (3.3.2) in the boulders remaining after a blast

### 3.1.13

#### **exploratory drilling**

application of the mechanical engineering technology of deep *drilling* (3.1.11) to determine the profile of the formation and retrieve strata samples to obtain the relevant geological parameters

[SOURCE: IWA 33-1:2019, 5.19]

### 3.1.14

#### **face drilling**

*drilling* (3.1.11) of *blast holes* (3.3.2) in the front wall at the end of a drift, rock *chamber* (3.22.6) or tunnel

### 3.1.15

#### **fan drilling**

*long hole production drilling* (3.1.17) where the holes are drilled in the same plane but at different angles, both left and right of vertical, to form a fan like array

### 3.1.16

#### **line drilling**

technique involving a single row of closely spaced, uncharged, small diameter holes drilled along the required excavation line, thereby providing a plane of weakness to which the primary blast can break

[SOURCE: BS 3618-6:1972]



**3.1.17****long hole production drilling**

*drilling* (3.1.11) of *blast holes* (3.3.2) of extended length to excavate ore

**3.1.18****probe drilling**

*drilling* (3.1.11) of long holes with a *face drilling* (3.1.14) rig in the direction of the drift to examine the rock formation

**3.1.19****reaming**

enlargement of a drill hole by using a larger drill or *blasting* (3.30.1.1)

Note 1 to entry: The term reaming also refers to widening a shaft, drift or tunnel.

**3.1.20****shaft sinking drilling**

*drilling* (3.1.11) of *blast holes* (3.3.2) for sinking a shaft

**3.2 Rock drilling technologies****3.2.1****boxhole boring**

*drilling* (3.1.11) method where an opening upwards from a drift to a production room is achieved by boring it to its full diameter in a single pass with a machine designed specifically for the purpose

**3.2.2****down-the-hole drilling****DTH**

in-the-hole drilling

**ITH**

*drilling* (3.1.11) of holes using a *down-the-hole hammer rock drill* (3.10.3)

**3.2.3****percussive drilling**

method of *drilling* (3.1.11) whereby repeated *blows* (3.30.1.15) are applied by the bit, which is repositioned by intermittent rotation

[SOURCE: BS 3618-6:1972]

**3.2.4****raise boring**

connection of two levels by *drilling* (3.1.11) a pilot hole down to the lower level, removing the *drill bit* (3.11.1) and replacing it by a reamer head which is then rotated and pulled back up towards the machine to create the raise

**3.2.5****rotary drilling**

method of *drilling* (3.1.11) in which rotation and thrust are applied to the bit, producing a continuous *cutting* (3.3.4) action

Note 1 to entry: The ground or rock at the bottom of the borehole is crushed or cut by pressure, shear or tensile stress produced by the different drilling tools. The *collarings* (3.3.3) are periodically or continuously removed out of the bore hole.

Note 2 to entry: Drill bits can be of the roller or drag types.

[SOURCE: BS 3618-6:1972, modified — Notes to entry have been added.]

### 3.2.6

#### **rotary-percussive drilling**

method of *drilling* (3.1.11) in which repeated *blows* (3.30.1.15) are applied to the *bit* (3.11.1) which is continually rotated under power

Note 1 to entry: The piston is typically powered by either hydraulic fluid or compressed air. At the same time the drill bit is rotated either continuously or intermittently.

Note 2 to entry: The *collarings* (3.3.3) can be continuously removed out of the borehole by a *flushing medium* (3.18.1), which is carried to the drilling tool.

[SOURCE: BS 3618-6:1972, modified — Notes to entry have been added.]

### 3.2.7

#### **tube drilling**

*drilling* (3.1.11) method where a rotation *torque* (3.16.13) is transferred to the *drill bit* (3.11.1) through relatively thin wall tubes rather than rods, with a minimum-sized flushing fluid canal

## 3.3 Bore holes, bench and cuttings

### 3.3.1

#### **bench**

part of the face of a large excavation which is not advanced as part of the round but as a separate operation

[SOURCE: BS 3618-6:1972]

### 3.3.2

#### **blast hole**

drilled hole for charging with *explosive* (3.25.1.4) for *blasting* (3.30.1.1) of rock

### 3.3.3

#### **collaring**

operation of starting to bore a hole

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[SOURCE: BS 3618-6:1972]

### 3.3.4

#### **cutting**

particles of geological formations formed in the borehole by the *collaring* (3.3.3) action of the *drilling* (3.1.11) tool

### 3.3.5

#### **flanking hole**

*shothole* (3.30.1.27) drilled at an acute angle to the coal face for the purpose of trimming it

[SOURCE: BS 3618-6:1972]

### 3.3.6

#### **lifter**

*shothole* (3.30.1.27) drilled at floor level

[SOURCE: BS 3618-6:1972]

### 3.3.7

#### **top hole**

horizontal or upwardly inclined *shothole* (3.30.1.27) placed at the foot of a face

Note 1 to entry: Top holes are placed generally in quarries.

[SOURCE: BS 3618-6:1972]

### 3.4 Hole properties

#### 3.4.1

##### **alignment deviation**

difference of actual and intended alignment of drilled hole

#### 3.4.2

##### **bolt hole**

drilled hole where *rock bolts* (3.15.7) can be anchored

#### 3.4.3

##### **drill pattern**

pattern of holes drilled to excavate a specified size of opening in mining and construction

#### 3.4.4

##### **hole depth**

length of the hole in the vertical/horizontal direction

#### 3.4.5

##### **hole depth measurement**

function for automatic measuring of drill depth

#### 3.4.6

##### **hole length**

length of the hole, parallel to the *drilling* (3.1.11) direction

#### 3.4.7

##### **hole length measurement**

function for automatic measuring of drill length

#### 3.4.8

##### **hole deviation**

difference of actual and intended position of drill holes that occurs during *drilling* (3.1.11)

#### 3.4.9

##### **look-out angle**

angle between the practical (drilled) and the theoretical tunnel profile

### 3.5 Rock reinforcement methods

#### 3.5.1

##### **cable bolting**

process of fixing cables with *cement grout* (3.15.3) or chemical compounds to stabilize the rock mass, in long holes being drilled in rock

#### 3.5.2

##### **grouting**

##### **injection**

input of material (which normally hardens) in joints and voids of the rock for sealing or reinforcement

EXAMPLE Cement, resin and plastic.

#### 3.5.3

##### **meshing**

netting

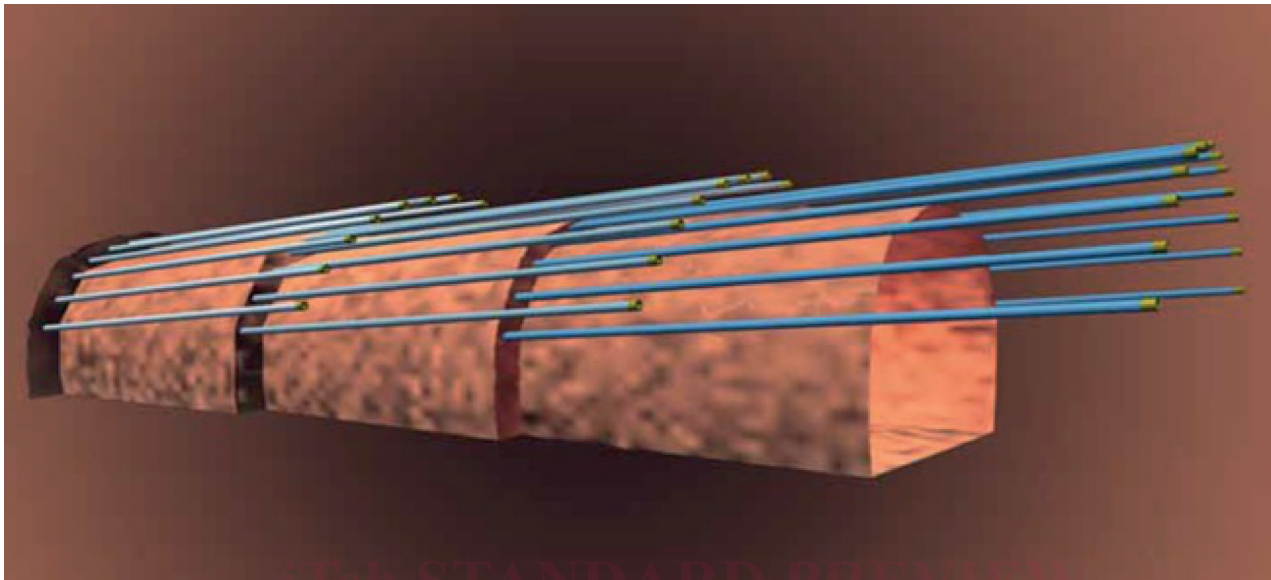
installing a net as rock support on ceiling or walls

### 3.5.4

#### **pipe roofing**

pre-reinforcement of the ground ahead of the tunnel face with steel pipes, arranged like an umbrella or canopy around the excavation line, to ensure that the excavation can proceed safely

Note 1 to entry: See [Figure 1](#).



**Figure 1 — Pipe roofing**

### 3.5.5

#### **rock bolting**

##### **bolting**

method of securing or strengthening closely jointed or highly fissured rocks by inserting and firmly anchoring *rock bolts* ([3.15.7](#)) oriented perpendicular to the rock face or mine opening, in mine workings, tunnels, or rock abutments

### 3.5.6

#### **selective bolting**

*bolting* ([3.5.5](#)) of weak sections or loose rock

### 3.5.7

#### **systematic bolting**

*bolting* ([3.5.5](#)) in a pre-determined pattern

## 3.6 Hand-held machines

### 3.6.1

#### **airleg**

device, incorporating a pneumatic cylinder, providing support and thrust for a *jackhammer* ([3.6.5](#))

[SOURCE: BS 3618-6:1972]

### 3.6.2

#### **burster**

hydraulic mechanism which, when inserted into a large diameter *shothole* ([3.30.1.27](#)), breaks down the strata by means of pistons operating transversely

[SOURCE: BS 3618-6:1972]

**3.6.3****hammer drill**

percussive drill

[SOURCE: BS 3618-6:1972]

**3.6.4****hydraleg**device, incorporating a hydraulic cylinder, providing support and thrust for a *jackhammer* ([3.6.5](#))

[SOURCE: BS 3618-6:1972]

**3.6.5****jackhammer**

light percussive drill used by hand or with some light support

[SOURCE: BS 3618-6:1972]

**3.6.6****stoper**light percussive drill incorporating a pneumatic cylinder to provide support and thrust when *drilling* ([3.1.11](#)) steeply upward

[SOURCE: BS 3618-6:1972]

**3.7 Equipment mainly for hand-held machines****3.7.1****hollow drill rod**

hollow drill steel

hollow drill stem

*drill rod* ([3.13.2](#)) or *stem* ([3.7.5](#)) having an air to remove *collaring* ([3.3.3](#)) from a drill hole, or for the extraction of collarings by suction

[SOURCE: BS 3618 6:1972]

**3.7.2****line oiler**

device for lubricating a drill by feeding oil gradually into the compressed air supply

[SOURCE: BS 3618-6:1972]

**3.7.3****scroll**helical projection on a *drill rod* ([3.13.2](#)) or *stem* ([3.7.5](#)) to remove the *collarings* ([3.3.3](#)) from the hole

[SOURCE: BS 3618-6:1972]

**3.7.4****shank**end of the rod that engages with the *chuck* ([3.12.1](#)) of the *drilling* ([3.1.11](#)) machine

[SOURCE: BS 3618-6:1972]

**3.7.5****stem**

drill steel

integral steel

&lt;drilling&gt; round or hexagonal steel rod for boring

Note 1 to entry: Compare with [3.22.18.2](#).

[SOURCE: BS 3618-6:1972]

## 3.8 Rigs

### 3.8.1

#### **bench drill rig**

*rock drill rig* (3.8.15) designed to drill *blast holes* (3.3.2) on *benches* (3.3.1)

### 3.8.2

#### **blasthole drill rig**

*rock drill rig* (3.8.15) designed to drill *blastholes* (3.27.1)

### 3.8.3

#### **cable bolting drill rig**

*rock drill rig* (3.8.15) for *drilling* (3.1.11) long holes in rock and fixing cables in them with *cement grout* (3.15.3) to stabilize the rock mass

### 3.8.4

#### **dimensional stone rig**

*rock drill rig* (3.8.15) designed for *drilling* (3.1.11) holes for quarrying of natural stone

### 3.8.5

#### **drill boom**

adjustable arm projecting from a *drill carriage* (3.8.6) to carry a drill and hold it in selected positions

[SOURCE: BS 3618-6:1972]

### 3.8.6

#### **drill carriage**

vehicle on which one or more *drill booms* (3.8.5) are mounted to permit drills to be brought easily to their work and to be removed before *blasting* (3.30.1.1)

Note 1 to entry: See also *jumbo* (3.8.8).

[SOURCE: BS 3618-6:1972]

### 3.8.7

#### **drill rig for soil and rock mixture**

self-propelled or towed machine on wheels, crawlers or legs, having equipment to drill soil and a mixture of soil and rock, such as: geothermal drill rig, water well drill rig, water jet drill rig, micro pile drill rig, surface horizontal directional drill rig

### 3.8.8

#### **jumbo**

*drill carriage* (3.8.6) or mobile scaffold on which several drills of *drifter* (3.10.2) type are mounted

Note 1 to entry: It is used in tunnels and large headings.

[SOURCE: Reference [2]]

### 3.8.9

#### **long-hole drill rig**

*rock drill rig* (3.8.15) designed for *drilling* (3.1.11) long production *blast holes* (3.3.2) in a mine

### 3.8.10

#### **meshing rig**

netting rig

*rock drill rig* (3.8.15) for installing net (mesh)

**3.8.11****raise bore machine**

RBM

*rock drill rig* (3.8.15) for *raise boring* (3.2.4)**3.8.12****raise climber***rock drill rig* (3.8.15) on rails, designed for *drilling* (3.1.11) and *blasting* (3.30.1.1) vertical or near vertical shaft or raise**3.8.13****rock boring machine***rock drill rig* (3.8.15) used to create an underground opening, drift or tunnel by mechanically boring out the rock**3.8.14****rock bolting drill rig***rock drill rig* (3.8.15) designed for *drilling* (3.1.11) holes and installing *rock bolt* (3.15.7)**3.8.15****rock drill rig**

rock drill machine

self-propelled or towed machine on wheels, crawlers or legs, having equipment to drill rock

Note 1 to entry: Rock drill rigs are designed to provide one or more of the rock *drilling* (3.1.11) concepts of [Clause 3.1](#), using one or more of the rock drilling technologies of [Clause 3.2](#). They can be designed for use on the surface or underground or both. Rock drill rigs normally consist of a carrier carrying one or more rock drills and the supporting systems needed to carry out the drilling.

Note 2 to entry: Machinery can be of a type either directly controlled by an operator riding or not riding on the machine, or can be remotely controlled by wired or wireless means with or without direct view on the *working area* (3.20.14). See ISO 6165:2022, Annex B for types of operator control configurations.

[SOURCE: EN 16228 1:2014]

**3.8.16****rock reinforcement rig***rock drill rig* (3.8.15) equipped for *bolting* (3.5.5), *meshing* (3.5.3) or *grouting* (3.5.2) or a combination of them**3.8.17****scaling machine**

self-propelled or towed machine on wheels, crawlers or legs, having equipment to scale rock

**3.8.18****wagon drill***drilling* (3.1.11) machine mounted on a light, wheeled carriage

[SOURCE: BS 3618-6:1972]

**3.9 Support components and systems****3.9.1****articulated carrier machine***carrier machine* (3.9.2) with an articulated frame which accomplishes the steering of the machine

[SOURCE: ISO 6165:2022, 3.2.6.2, modified — “dumper” has been replaced with “carrier machine”.]