BS EN 61029-2-4:2011
Incorporating August 2011 corrigendum

BSI Standards Publication

Safety of transportable motor-operated electric tools

Part 2-4: Particular requirements for bench grinders

National foreword

This British Standard is the UK implementation of EN 61029-2-4:2011. It is derived from IEC 61029-2-4:1993+A1:2001. It supersedes BS EN 61029-2-4:2003 which is withdrawn.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags [C] ⟨C].

The UK participation in its preparation was entrusted to Technical Committee CPL/116, Portable motor-operated tools.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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English version

Safety of transportable motor-operated electric tools - Part 2-4: Particular requirements for bench grinders

(IEC 61029-2-4:1993, modified + A1:2001, modified)

Sécurité des machines-outils électriques semi-fixes - Partie 2-4: Règles particulières pour les tourets à meuler (CEI 61029-2-4:1993, modifiée + A1:2001, modifiée)

Sicherheit transportabler motorbetriebener Elektrowerkzeuge - Teil 2-4: Besondere Anforderungen für Tischschleifmaschinen (IEC 61029-2-4:1993, modifiziert + A1:2001, modifiziert)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of the International Standard IEC 61029-2-4:1993 + A1:2001, prepared by IEC TC 116, Safety of hand-held motor-operated electric tools, together with the common modifications prepared by the Technical Committee CENELEC TC 116, Safety of motor-operated electric tools, was submitted to the formal vote and was approved by CENELEC as EN 61029-2-4 on 2011-01-10.

This document supersedes EN 61029-2-4:2003 + corrigendum April 2003 + A1:2003.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-01-10
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-01-10

In this document, the common modifications to the International Standard are indicated by a vertical line in the left margin of the text.

This European Standard is divided into two parts:

Part 1 General requirements which are common to most transportable electric motor operated tools (for the purpose of this standard referred to simply as tools) which could come within the scope of this standard;

Part 2 Requirements for particular types of tool which either supplement or modify the requirements given in part 1 to account for the particular hazards and characteristics of these specific tools.

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of the Machinery Directive 2006/42/EC. See Annex ZZ.

Compliance with the relevant clauses of Part 1 together with this Part 2 provides one means of conforming with the specified essential health and safety requirements of the Directive.

For noise and vibration this standard covers the requirements for their measurement, the provision of information arising from these measurements and the provision of information about the personal protective equipment required. Specific requirements for the reduction of the risk arising from noise and vibration through the design of the tool are not given as this reflects the current state of the art.

As with any standard, technical progress will be kept under review so that any developments can be taken into account.

Warning: Other requirements and other EC Directives can be applicable to the products falling within the scope of this standard.

Part 2-4 is to be used in conjunction with EN 61029-1:2009.
Part 2-4 supplements or modifies the corresponding clauses of EN 61029-1, so as to convert it into the European Standard: Safety requirements for transportable bench grinders.

Where a particular subclause of Part 1 is not mentioned in this Part 2-4, that subclause applies as far as is reasonable. Where this Part 2-4 states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

Subclauses, tables and figures which are additional to those in Part 1 are numbered starting from 101. Subclauses, tables and figures which are additional to those in IEC 61029-2-4 are prefixed "Z".

NOTE In this European Standard the following print types are used:
- Requirements proper;
- *Test specifications;*
- Explanatory matter.

Contents

SAFETY OF TRANSPORTABLE MOTOR-OPERATED ELECTRIC TOOLS
Part 2: Particular requirements for bench grinders

1 Scope

This clause of Part 1 is applicable except as follows:

〈C〉 **1.1** *Addition:*

This standard applies to transportable bench grinders (see Figure 101) and combined bench grinders (see Figure 107) with a wheel diameter and brush diameter not exceeding 200 mm, a thickness not exceeding 30 mm and a peripheral speed not exceeding 50 m/s, as defined in 2.101 and 2.107.

The requirements for bonded abrasive products (wheel) are given in EN 12413. The requirements for brushes are given in EN 1083-2.

Stationary grinding machines are covered by EN 13218.

Bench grinders where the wheel partly runs in a water reservoir are not considered as tools with water supply. 〈C〉

2 Terms and definitions

This clause of Part 1 is applicable except as follows:

2.21
normal load
〈C〉 the load to obtain rated input

2.101
bench grinder
tool designed to grind metal or similar materials by means of one or two rotating abrasive wheels fixed on the tool spindle, the work piece being held by hand (see Figure 101)

2.102
accessory
device or piece other than a grinding wheel intended to be mounted on the bench grinder spindle

2.103
tool spindle
motor spindle of the bench grinder or of the combined bench grinder which supports the brush and/or grinding wheels and transports the rotation to them

2.104
guard for wheel
device which partially encloses the abrasive wheel in order to protect the user against accidental contact with the wheel in normal use and against ejection of fragments of the wheel in the protected area in case of breakage of the wheel 〈C〉

Ⓒ **2.105**
flange assembly
means provided to clamp an abrasive wheel to the tool spindle

2.106
work rest
surface or device intended to support or guide the piece to be worked

2.107
combined bench grinder
tool designed to grind metal or similar materials or to clean, polish or deburr metal or similar materials by means of an abrasive wheel and a brush fixed on opposite ends of the tool spindle, and which is located in a proper workplace and where pieces are held by hand Ⓒ

3 General requirement

This clause of Part 1 is applicable.

4 General notes on tests

This clause of Part 1 is applicable.

5 Rating

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable.

7 Marking

This clause of Part 1 is applicable except as follows:

7.1 *Addition:*

Ⓒ – the rated no-load speed in …/min or min^{-1};
– the minimum and maximum diameter *D* of the wheel to be used;
– indication of the direction of rotation of the grinding wheel;
– for combined bench grinders, the minimum and maximum diameter *D* of the brush to be used;
– for combined bench grinders, a warning near to the brush spindle never to use a grinding wheel on the brush side of the machine;
– a warning to wear safety glasses or the relevant symbol. Ⓒ

7.6 *Addition:*

The direction of rotation of the wheel shall be indicated on the tool by an arrow raised or sunk or by any other means not less visible and indelible.

7.13 *Addition:*

〈C〉 The handbook or information sheet shall include all the necessary information for safe working with the bench grinder or combined bench grinder, such as method of operation, wheel and brush changing, maintenance, assembly, transportation, etc.

The substance of the following instructions shall also be given:

– warning not to use damaged or misshapen wheels or brushes;
– instruction to use only grinding wheels and brushes which have a marked speed equal to or greater than the speed marked on the nameplate of the tool;
– instruction to adjust the spark arrestor frequently so as to compensate for wear of the wheel, keep the distance between the spark arrestor and the wheel as small as possible and in any case not greater than 2 mm;
– instructions for the safe use, handling and storage of abrasive wheels and brushes;
– if the grinder is intended to be bolted down, an instruction requesting it to be secured to a suitable work surface;
– for combined bench grinders, instruction to always keep the brush assembled on the spindle in order to limit the risk of contact with the rotating spindle;
– details of the grinding wheel(s) recommended, the maximum thickness of the wheel and the diameter of the hole in the wheel;
– for combined bench grinders, details of the brushes recommended, the maximum thickness of the brush and the diameter of the hole in the brush;
– the maximum wear of the wheel allowed before replacement;

NOTE Sketches may be used to illustrate the modes of operation. 〈C〉

8 Protection against electric shock

This clause of Part 1 is applicable.

9 Starting

This clause of Part 1 is applicable.

10 Input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable.

12 Leakage current

This clause of Part 1 is applicable.

〈C〉13 Environmental requirements

This clause of Part 1 is applicable except as follows:

13.1 *This subclause is not applicable.*

13.2.4 *Replacement of paragraphs 1 and 2:*

Bench grinders and combined bench grinders are tested at no-load.

NOTE The most important sources of noise for bench grinders are the workpiece and the wheel or brush. As these sources of noise cannot be influenced by the design of the tool, the noise is measured at no-load.

13.3 *This subclause is not applicable.*〈C〉

14 Protection against ingress of foreign bodies and moisture resistance

〈C〉This clause of Part 1 is applicable except as follows:

14.4 If the tool is constructed to IPX4 or above, this subclause is not applicable.

14.5 If the tool is constructed to IPX4 or above, this subclause is not applicable.〈C〉

15 Insulation resistance and electric strength

This clause of Part 1 is applicable.

16 Endurance

This clause of Part 1 is applicable.

17 Abnormal operation

This clause of Part 1 is applicable.

18 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows:

18.1 *Addition:*

Bench grinders and combined bench grinders shall be equipped with an adequate guarding system which cannot be removed without the aid of a tool.

The guarding system shall comply with the requirements of 18.1.101.

〈C〉18.1.101 Guard for wheel

Bench grinders and combined bench grinders shall be equipped with guards which leave uncovered only a portion of the wheel as allowed in 18.1.101.2 and indicated in Figure 103.

On straight-sided wheels the side guard shall cover the flanges and the end of the tool spindle.〈C〉

〈C〉 The guard shall be designed so that the tool cannot be fitted with a wheel greater than 1,07 times the maximum diameter marked on the tool.

18.1.101.1 Strength of guards

Guards for straight sided wheels shall either:

a) have a thickness as given in Table Z101 or Table Z102, provided the guard is made of material in accordance with Table Z103; or

b) meet the requirements of 18.1.101.1.Z1.

Guards for cup wheels shall either:

a) have a thickness as given in Table Z101 or Table Z102, provided the guard is made of material in accordance with Table Z103; or

b) if the bench grinder is also fitted with a straight sided wheel and that guard meets the requirements of 18.1.101.1.Z1, be of the same material and thickness as the guard for the straight sided wheel.

Table Z101 − Guard thickness for steel

Material (see Table Z103)	**Peripheral speed** m/s	**Wheel thickness** mm	**Wheel diameter in mm**					
			≤ 125		≤ 200		≤ 250	
			P	J	P	J	P	J
1, 2 & 3	32	50	1,5	1,5	2	1,5	3	2
1, 2 & 3	40	25	1,5	1,5	2	1,5	2,5	2
		50	1,5	1,5	2	1,5	3,5	2
1, 2 & 3	50	25	1,5	1,5	2	1,5	3	2
		50	2	1,5	3	2	4,5	3

Table Z102 − Guard thickness for aluminium

Material (See Table Z103)	**Peripheral speed** m/s	**Wheel thickness** mm	**Wheel diameter in mm**					
			≤ 125		≤ 200		≤ 250	
			P	J	P	J	P	J
7	32	10	5,5	5	6,5	5	8	6
		20	6	5	8	6	10	8
		32	6,5	5	9	7	12	10
	50	10	6	5	8,5	7	10,5	9
		20	7	6	10	8	13	11
6	40	10	2,5	2,5	3,5	3,5	4	4
		20	3	3	4	4	5	5
		32	3,5	3,5	4,5	4,5	6	5
	50	10	3	3	4	4	5	5
		20	3,5	3,5	4,5	4,5	6	5
		32	4	4	5	5	7	6

〈C〉

〈C〉 Table Z103 − Material specifications

Reference No.	Material	ISO or EN	Ultimate tensile strength N/mm^2	Elastic strength N/mm^2	Elongation %
1	Steel	ISO 3574 EN 10130	270	140	28
2	Steel	ISO 4997 ISO 6316	300	220	18
3	Steel	ISO 1052 EN 10025-2	340	215	17
4	Steel	ISO 3755	450	230	22
6	Aluminium	ISO 6361	310	260	10
7	Aluminium	ISO 3522	200	-	3

18.1.101.1.Z1 Strength test

The tool shall be assembled as for normal use, the guard shall be equipped with any attachments for which it is designed.

The tool shall be fitted with a grinding wheel of the same dimensions as recommended for normal use and shall be rotating at maximum speed. A projectile shall be made to impact the wheel as close as possible to the flange so as to cause a complete breakage of the wheel, care being taken that the projectile does not itself affect the outcome of the test (see Figure 102).

This test is dangerous and must only be carried out in a properly constructed and equipped test facility. The test must be carried out in a fully protected enclosure which can contain all the wheel fragments and other debris.

Compliance is checked by test and inspection. After the test the wheel guard shall remain attached to the tool, remain effective and shall show no visible crack when examined by a recognised method of crack detection. Minor deformations and superficial damage are acceptable. Any fixing devices such as guard clamps, bolts etc. shall remain effective.

18.1.101.2 Openings in the guard

18.1.101.2.1 For straight-sided wheels the opening angle in the guard shall not exceed 65° above the horizontal plane passing through the centre of the wheel.

Under this plane the opening height *H* shall be smaller than 0,2 *D* (see Figure 103) but in any case the total opening angle shall not exceed 90°.

18.1.101.2.2 For straight-sided cup wheels the height of the opening in the guard shall not be greater than 0,4 *D* above the horizontal plane passing through the axis of the wheel (see Figure 104a)).

The opening in the guard *H*, below the horizontal plane passing through the axis of the wheel, shall not be greater than 0,2 *D* (see Figure 104b)).

The width of the opening in the guard periphery shall not be more than is sufficient to allow the use of the wheel until it is worn out.〈C〉

18.1.101.2.3 The side clearance between the wheel and the guard shall be as small as possible.

Compliance with 18.1.101.2 is checked by inspection and measurement.

18.1.101.3 Spark arrestor

Bench grinders and combined bench grinders equipped with straight-sided wheels shall have a spark arrestor to limit the ejection of sparks and pieces of wheel from the wheel guard.

The spark arrestor shall be situated at the upper part of the wheel guard in line with the periphery of the wheel and cover all the width of the wheel guard.

The spark arrestor shall be adjustable to within 2 mm of the surface of the wheel for all diameters of wheel from the maximum wheel diameter to the minimum in accordance with 7.1.

Compliance is checked by inspection.

18.1.101.4 Work rest

Bench grinders and combined bench grinders shall be equipped with work rests. This requirement does not apply to the brush side of the combined bench grinder.

The work rest shall be adjustable to within 2 mm of the surface of the wheel for all diameters of wheel from the maximum wheel diameter to the minimum recommended by the manufacturer.

The work rest shall be adjustable without the aid of a tool, shall cover at least the width of the wheel guard and the fixings shall ensure a firm position of the rest.

When the bench grinder and/or the grinder side of the combined bench grinder is fitted with an inclinable work rest, the inclination shall only be possible downwards and the tilting upwards of the work rest shall be made impossible (Figure 105).

Compliance is checked by inspection.

18.1.101.Z1 Guard for brush

Combined bench grinders shall be equipped with guards at the brush side to prevent accidental contact with the rotating brushes and hazards caused by ejected fragments of the brush and sparks.

The guard shall cover an area of ≥ 180° of the periphery of the brush. The opening angle shall not exceed 65° above the horizontal plane passing through the centre of the brush. The width of the guard shall at least cover the length of the spindle. The guard may be open laterally, see Figure Z102.

The guard shall be mounted so that the tool cannot be fitted with a brush greater than 1,07 times the maximum diameter marked on the tool.

Compliance is checked by inspection and measurement.

18.1.102 Flange

18.1.102.1 Dimensional requirements

Table 101 gives minimal dimensions of flanges made from steel or other material of adequate strength with a minimal tensile strength of 430 N/mm^2 or from sintered powder metal with a minimal tensile strength of 500 N/mm^2 in relation to the diameter of the wheel or brush *D*.

Table 101 – Flange dimensions (see Figure 108)

D mm	d_f mm	***r*** mm	***E*** mm	***F*** mm	***T*** mm
$D \leq 100$	34	6	5	3,2	1,5
$100 < D \leq 125$	42	8	6	3,2	1,5
$125 < D \leq 150$	52	9	10	5	1,5
$150 < D \leq 200$	68	12	10	5	1,5

Cast iron flanges shall not be used.

18.1.102.2 Torque test for flanges

Flanges which do not fulfil the minimal dimensions or the minimal tensile strength specified in 18.1.102.1 shall be checked by the following test.

The abrasive wheel shall be replaced by a steel disc having the same dimensions.

The clamping nut shall be tightened with a first test torque according to Table Z104. A feeler gauge of thickness 0,05 mm shall be used to check whether the flanges are in contact with the disc all around the circumference. It shall not be possible to push the feeler gauge between the flange and the surface of the disc.

The clamping nut shall then be tightened to the second test torque according to Table Z104. It shall not be possible to push the feeler gauge between the flange and the surface of the disc by more than 1 mm at any point around the circumference of the flange.

Table Z104 − Test torque for flanges

Thread		**First test torque**	**Second test torque**
Metric	UNC	Nm	Nm
8		2	8
10	3/8	4	15
12	½	7,5	30
14		11	45
16	5/8	17,5	70
	¾	35	140

18.1.103 Transparent screens

18.1.103.1 Transparent screen characteristics

The bench grinders and combined bench grinders shall be fitted with transparent screens designed to prevent projection of particles towards the eyes and the face of the operator.

The transparent screens shall be adjustable and of such dimensions that in normal positions of grinding and polishing, including in a vertical plane above the wheel or the brush, the operator shall see the working part of the wheel or of the brush only through the screen.

The operation of adjusting the screen shall not modify the adjustment of other parts of the bench grinder or combined bench grinder.

The screen shall be made of transparent material having an appropriate resistance against shocks and abrasion. Ply glass and polycarbonate are recommended. Other plastic materials used must have an impact and resistance similar to ply glass and polycarbonate.

18.1.103.2 Minimal dimension of the transparent part of rectangular or trapezoidal transparent screens

The minimal dimensions of the transparent part of screens for bench grinders equipped with straight-sided cup wheels are identical to those of screens for bench grinders or combined bench grinders equipped with straight-sided wheels. However, for bench grinders and for the grinder side of the combined bench grinders, the thickness of straight-sided wheels shall be replaced by the width of the working part of the straight-sided cup wheel.

For all bench grinders and combined bench grinders, the screens shall be mounted in such a way that the symmetrical axis of the screen coincides with the vertical median plane of the working part of the wheel or the brush (Figure 106).

18.1.104 Protection of the free extremity of the rotating shaft in the combined bench grinder

The shaft part on the brush side, when not fitted with a brush, shall be protected in order to avoid accidental contact.

Compliance is checked by applying the test pin in Figure 2 of Part 1.

NOTE A possible solution for satisfying this requirement is shown in Figure 109.

18.2 *Replacement:*

Bench grinders and combined bench grinders shall have provision to be fixed on a support.

Compliance is checked by inspection.

19 Mechanical strength

〈C〉 This clause of Part 1 is applicable except as follows:

19.Z101 The wheel guards, including their fixing, shall have adequate mechanical strength to withstand the loading applied during handling.

Compliance is checked by the following test:

The grinder guards have to be supported in such a way that no other parts of the grinder are supported, neither by the supporting means nor by the bench, see Figure Z101.

A vertical downward force equal to the weight of the grinder is applied over the centre of the tool for 1 min.

There shall be no visible deformation of the guard during and after the test.

20 Construction

This clause of Part 1 is applicable except as follows:

20.18 *Replacement:*

Switches shall be so located that accidental operation is unlikely to occur.

Compliance is checked by applying a sphere with a diameter of (100 ± 1) mm to the switch.

It shall not be possible to start the tool by means of the sphere.

20.20 *Addition:*

Bench grinders and combined bench grinders are not considered to give rise to danger on restoration of the voltage supply.

20.22 If the tool is constructed to IPX4 or above, this subclause is not applicable. 〈C〉

21 Internal wiring

This clause of Part 1 is applicable.

22 Components

This clause of Part 1 is applicable.

23 Supply connection and external flexible cables and cords

This clause of Part 1 is applicable

24 Terminals for external conductors

This clause of Part 1 is applicable.

25 Provision for earthing

This clause of Part 1 is applicable.

26 Screws and connections

This clause of Part 1 is applicable.

27 Creepage distances, clearances and distance through insulation

This clause of Part 1 is applicable.

28 Resistance to heat, fire and tracking

This clause of Part 1 is applicable.

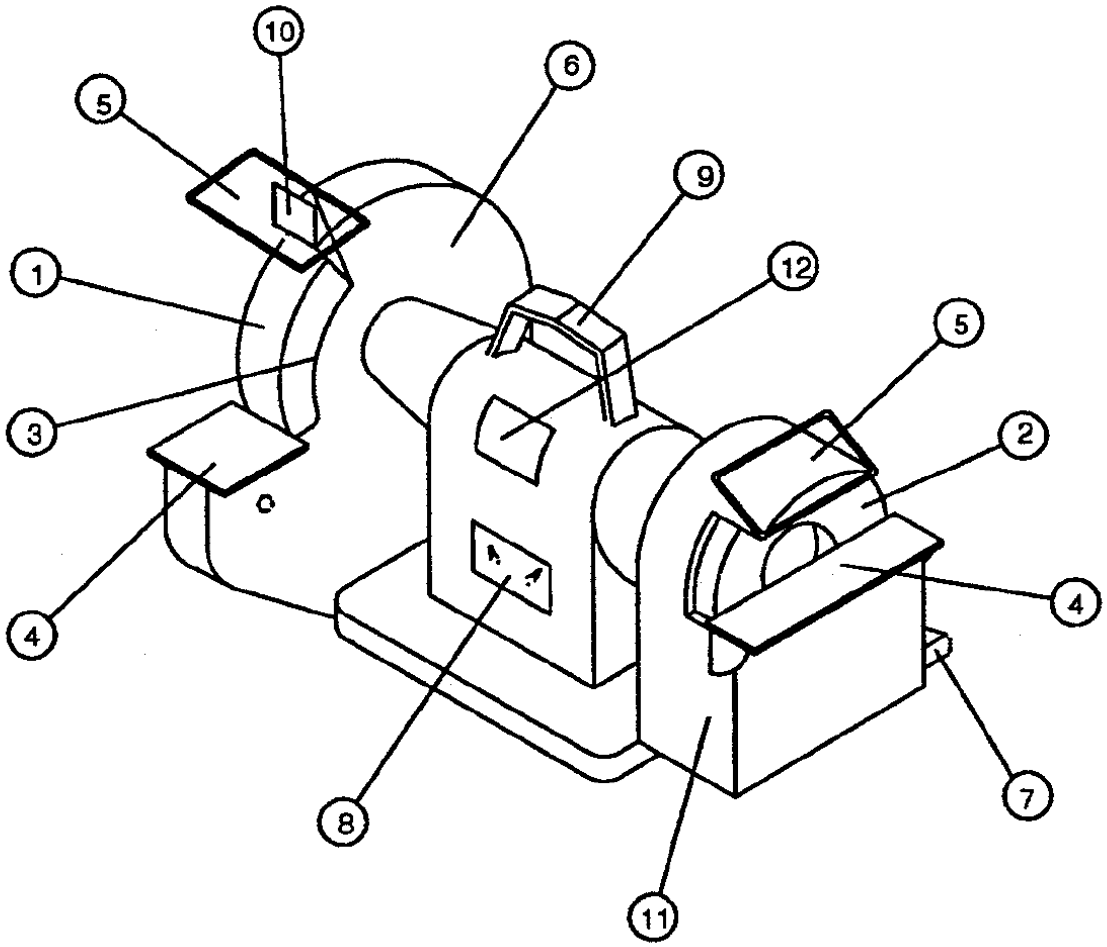
29 Resistance to rusting

This clause of Part 1 is applicable.

30 Radiation

This clause of Part 1 is not applicable.

〈C〉 All figures in this standard are examples of possible designs and serve as a guide only.

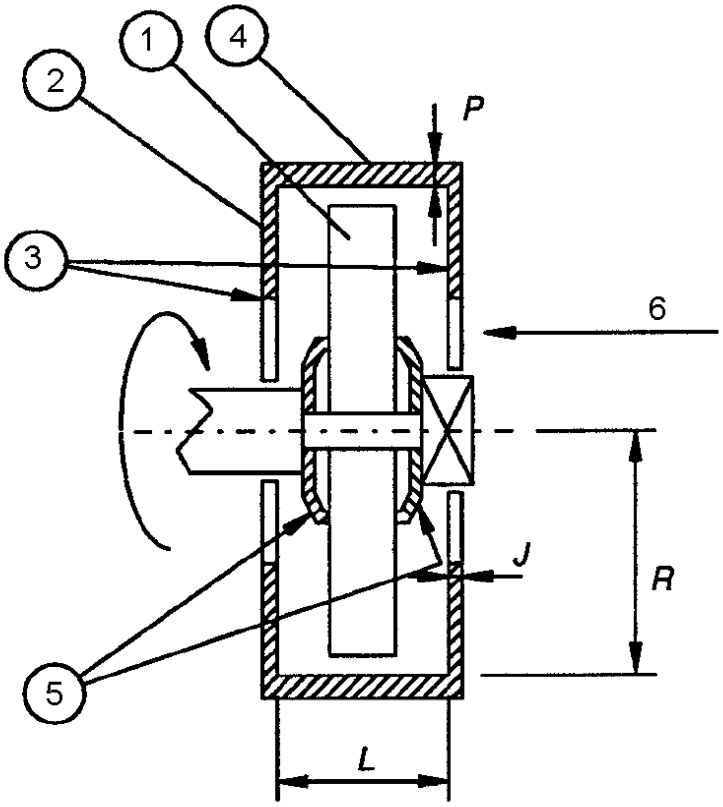


Key

1	Straight-sided grinding wheel	7	Nozzle, if any, for dust
2	Straight-sided cup wheel	8	“On”/”off” device
3	Flange	9	Motor housing
4	Work rest	10	Spark arrestor
5	Transparent screen	11	Cup wheel guard
6	Guard for straight-sided wheel	12	Marking plate

Figure 101 – Bench grinder 〈C〉

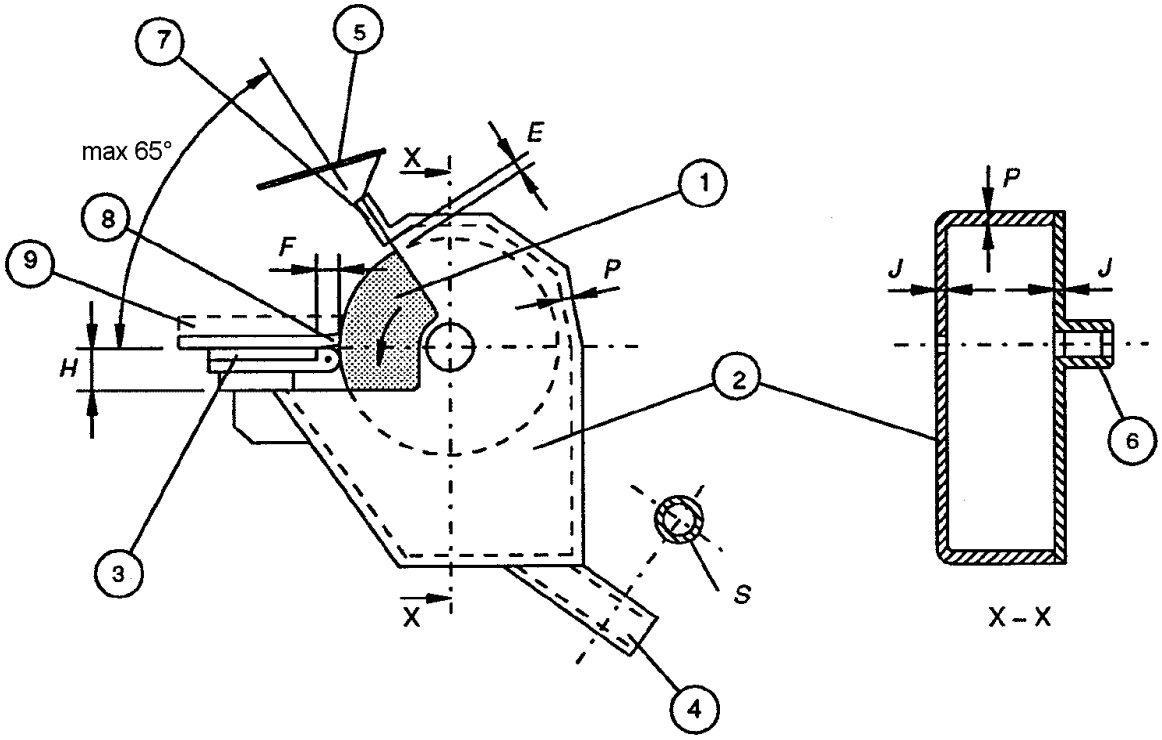
〈C〉



Key

1	Wheel	*P*	Thickness of the periphery of the guard
2	Guard	*J*	Thickness of the sides of the guard
3	Guard sides	*L*	Guard width
4	Guard periphery	*R*	Guard inside radius
5	Flanges		
6	Projectile		

Figure 102 − Schema 〈C〉

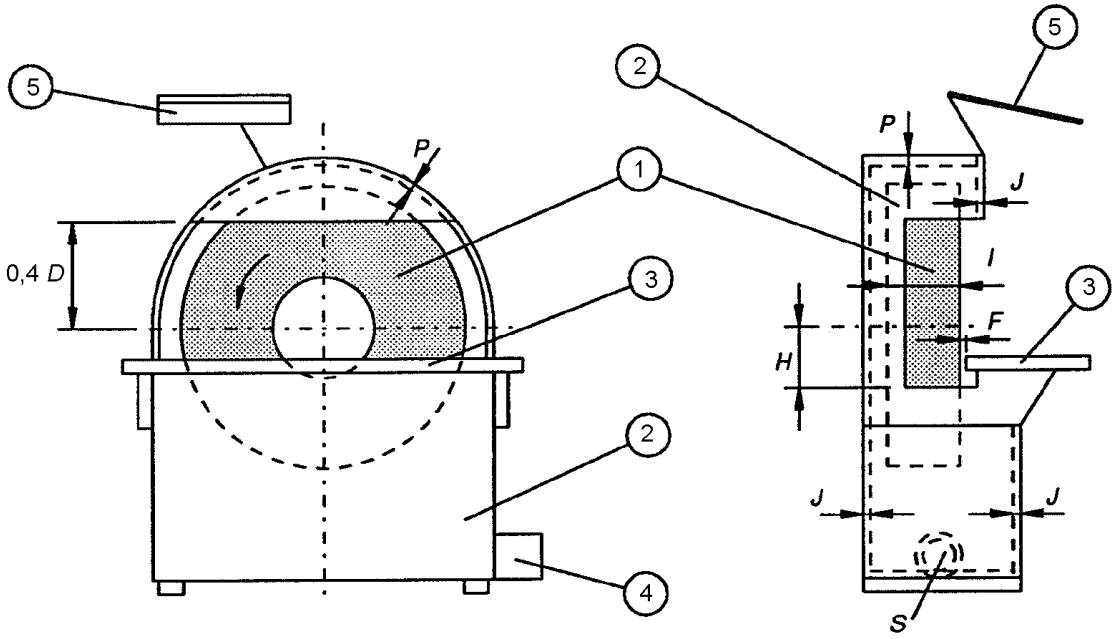


Key

1	Grinding wheel	*P*	Thickness of the periphery of the guard
2	Guard of the wheel	*J*	Thickness of the sides of the guard
3	Work rest	*S*	Internal section of the nozzle
4	Nozzle, if any, for dust	*D*	Maximum external diameter of the wheel
5	Transparent screen	*E*	Clearance between spark arrestor and wheel
6	Guard for axis	*F*	Clearance between work rest and wheel
7	Spark arrestor		
8	Working area of the wheel		
9	Work piece		

For articulation of the work rest, see Figure 105.

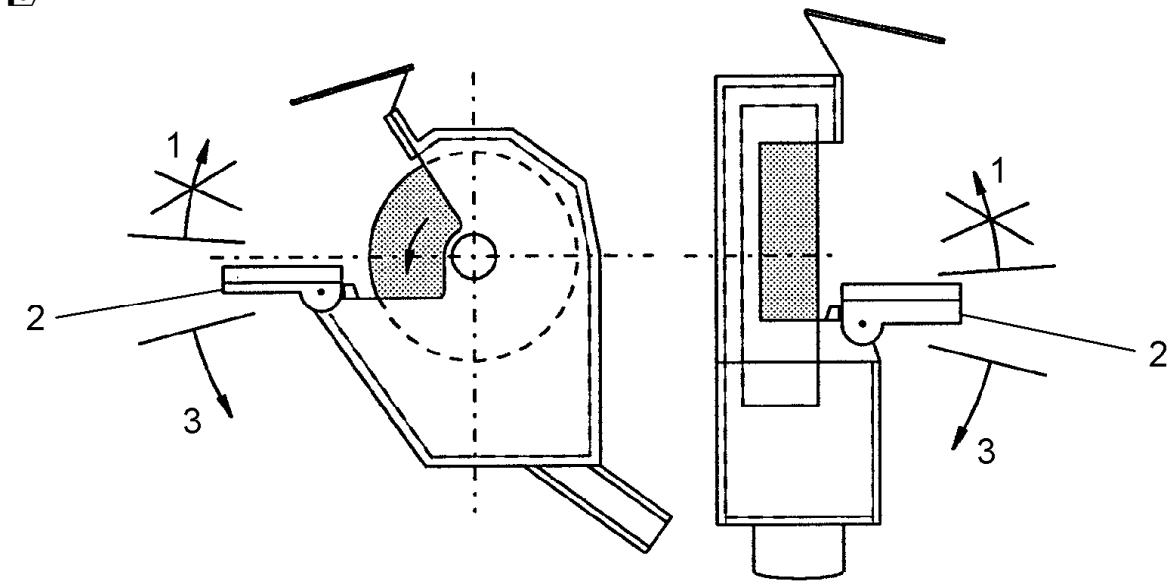
Figure 103 – Guard



Key

1	Grinding wheel	*P*	Thickness of the periphery of the guard
2	Guard of the wheel	*J*	Thickness of the sides of the guard
3	Work rest	*S*	Internal section of the nozzle
4	Nozzle, if any, for dust	*D*	Maximum external diameter of the wheel
5	Transparent screen	*F*	Clearance between work rest and wheel
		I	Thickness of the wheel

Figure 104 – Bench grinder equipped with straight-sided cup wheels



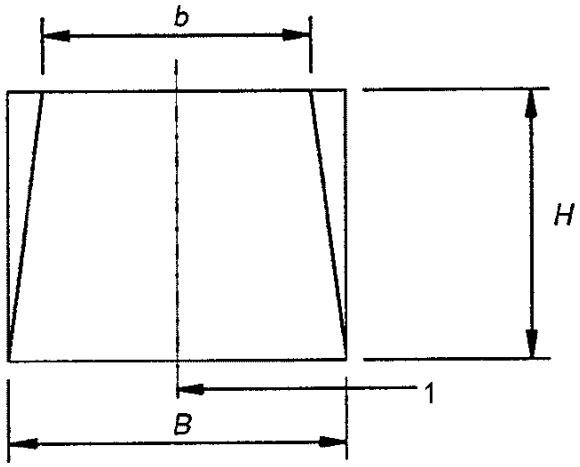
Key

1 No tilting upwards

2 Inclinable work rest

3 Tilting downwards allowed

Figure 105 − Bench grinder with inclinable work rest



Key

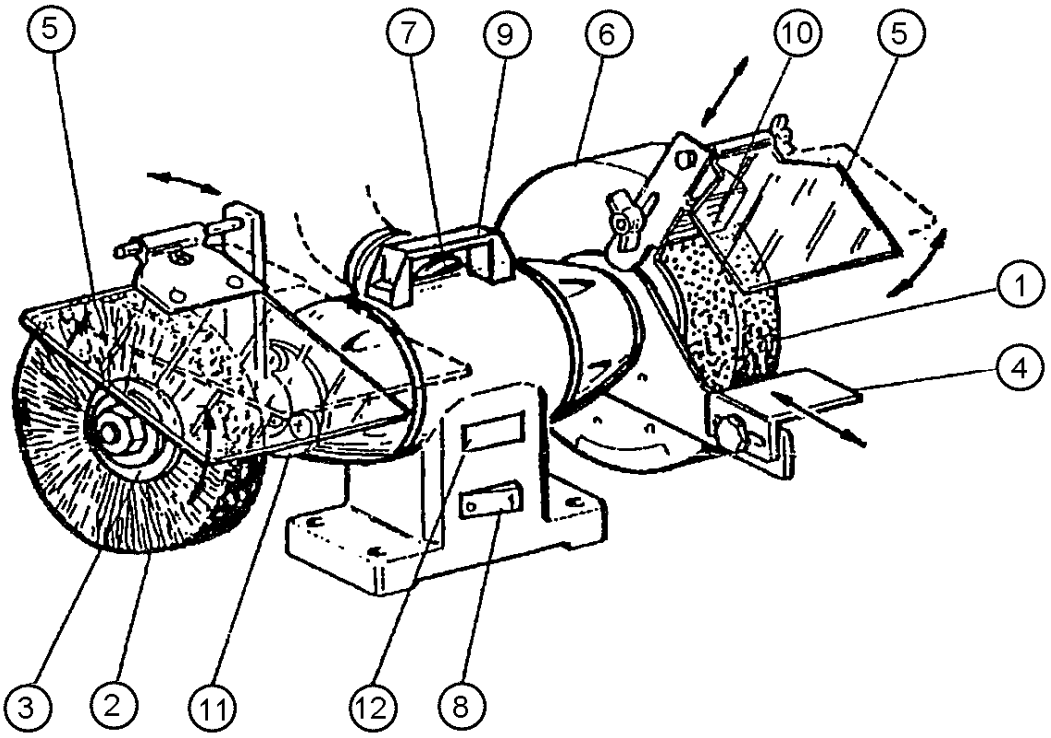
H ≥ 60 mm

B ≥ 75 mm

B ≥ 75 mm

1 Median vertical plane of the working part of the wheel

Figure 106 – Transparent screen

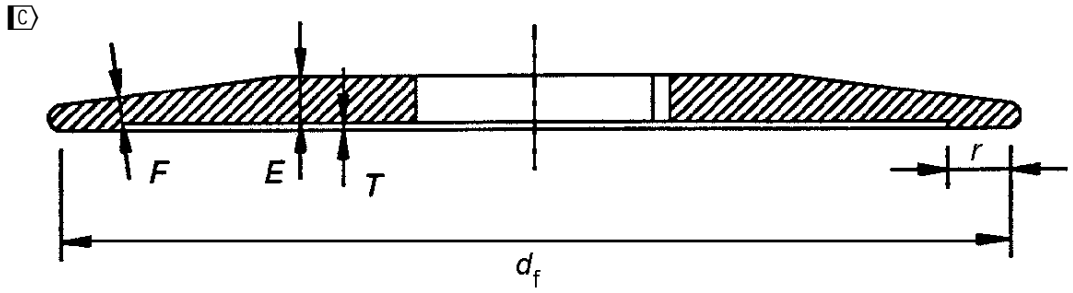


Key

1	Straight-sided grinding wheel	7	Nozzle, if any, for dust
2	Brush	8	“On”/”off” device
3	Flange	9	Handle
4	Work rest	10	Spark arrestor
5	Transparent screen	11	Cup shaft guard
6	Guard for straight-sided wheel	12	Marking plate

NOTE For simplicity, the machine is illustrated without the guard, required by 18.1.104.4, on the brush side.

Figure 107 – Combined bench grinder



Key

d_f Minimum external diameter of flange

r Minimum width of contact surface

E Minimum flange thickness on flat surface

F Minimum flange thickness on inclined surface

T Minimum depth of recess

Figure 108 – Flange dimensions

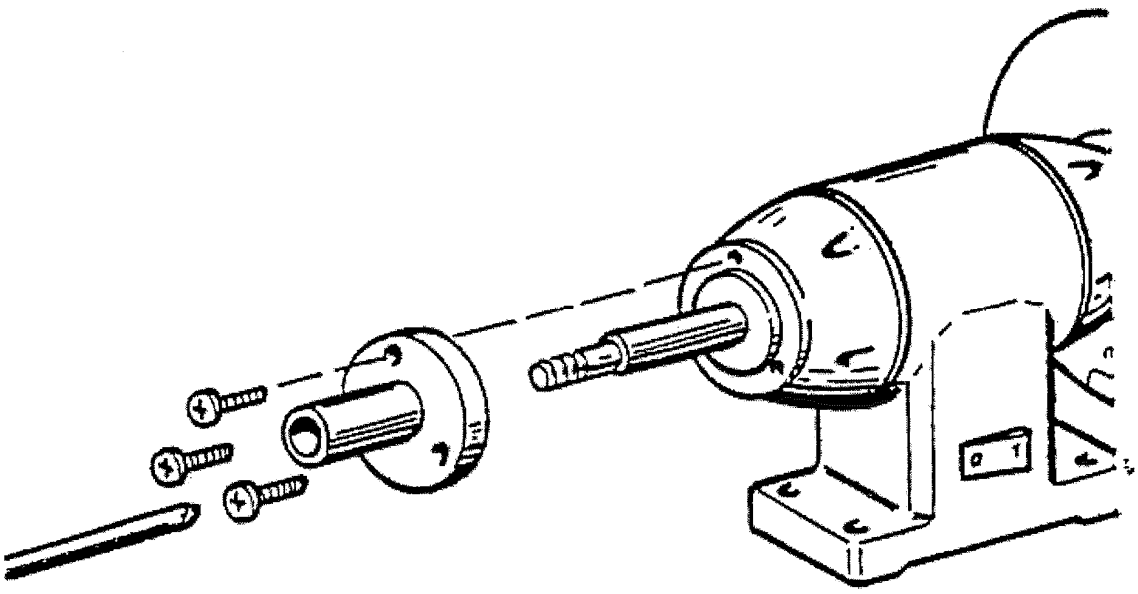
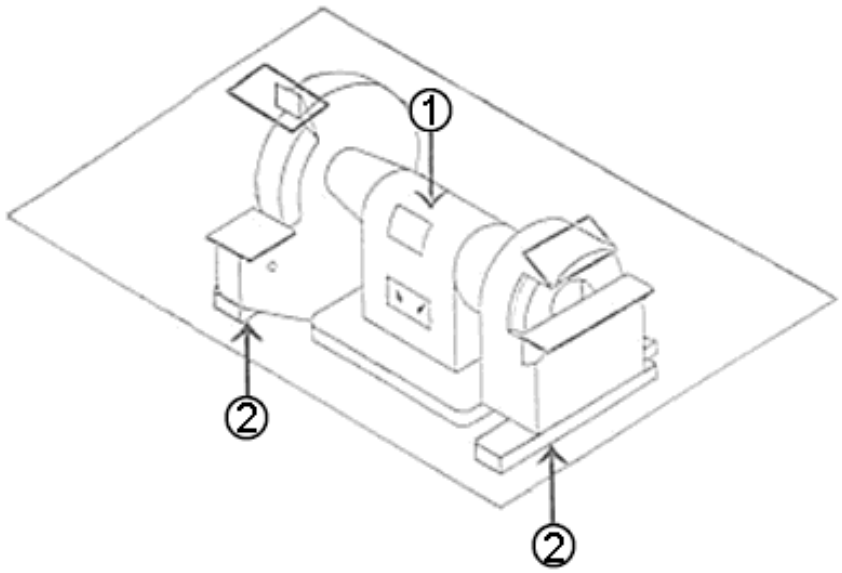


Figure 109 – Protection of the rotating shaft C

〈C〉

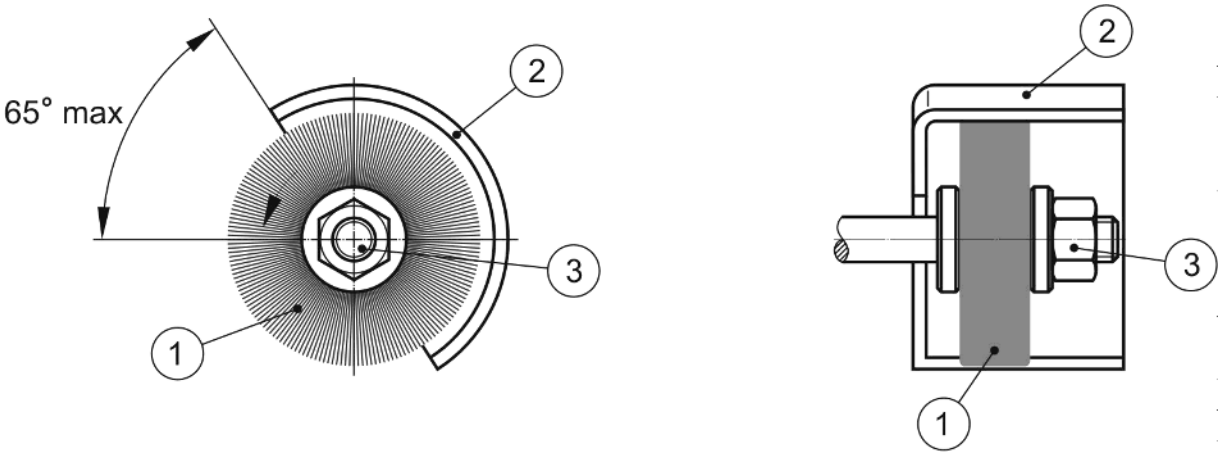


Key

1 Vertical load equal to the weight of the grinder

2 Support to the guard

Figure Z101 – Mechanical strength



Key

1 Brush

2 Guard

3 Spindle with flange and flange nut

Figure Z102 – Guard for brush 〈C〉

〈C〉 Annexes

The annexes of Part 1 are applicable except as follows:

Annex A
(normative)

Normative references

Addition:

Publication	Date	Title
EN 1083-2	1997	Power-driven brushes - Part 2: Safety requirements
EN 10025-2 + AC	2004 2005	Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels
EN 10130	2006	Cold rolled low carbon steel flat product for cold forming - Technical delivery conditions
EN 12413	2007	Safety requirements for bonded abrasive products
EN 13218 + A1 + AC	2002 2008 2010	Machine tools - Safety - Stationary grinding machines
ISO 1052	1982	Steels for general engineering purposes
ISO 3522	2007	Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties
ISO 3574	2008	Cold-reduced carbon steel sheet of commercial and drawing qualities
ISO 3755	1991	Cast carbon steels for general engineering purposes
ISO 4997	2007	Cold-reduced carbon steel sheet of structural quality
ISO 6316	2008	Hot-rolled steel strip of structural quality
ISO 6361	Series	Wrought aluminium and aluminium alloy sheets, strips and plates 〈C〉

[C] Annex ZZ
(informative)

Coverage of Essential Requirements of Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant Essential Requirements as given in EC Directive 2006/42/EC (Machinery Directive).

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directives concerned.

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard. [C]

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