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Incorporating corrigendum April 2021



BSI Standards Publication

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery — Safety

Part 2-3: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders

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National foreword

This British Standard is the UK implementation of EN IEC 62841-2- 3:2021+A11:2021. It is derived from IEC 62841-2-3:2020, incorporating corrigendum April 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to text carry the number of the amendment. For example, text altered by CENELEC amendment A11 is indicated by [A11] 〈A11〉.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum April 2021 is indicated in the text by [AC1] 〈AC1〉.

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

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

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Date	Text affected

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Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery - Safety - Part 2-3: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders (IEC 62841-2-3:2020)

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses - Sécurité - Partie 2-3: Exigences particulières pour les meuleuses portatives et pour les lustreuses et ponceuses portatives du type à disque (IEC 62841-2-3:2020)

Elektrische motorbetriebene handgeführte Werkzeuge, transportable Werkzeuge und Rasen- und Gartenmaschinen - Sicherheit - Teil 2-3: Besondere Anforderungen für handgeführte Schleifer, Polierer mit Polierscheibe und Schleifer mit Schleifblatt (IEC 62841-2-3:2020)

This European Standard was approved by CENELEC on 2020-05-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
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European foreword

The text of document 116/444/FDIS, future edition 1 of IEC 62841-2-3, prepared by IEC/TC 116 "Safety of motor-operated electric tools" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62841-2-3:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-05-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-05-03

This document supersedes EN 60745-2-3:2011 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

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

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of EN IEC 62841-2-3:2021/A11:2021.

Endorsement notice

The text of the International Standard IEC 62841-2-3:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60086-1	NOTE	Harmonized as EN 60086-1
IEC 61010-031	NOTE	Harmonized as EN 61010-031
IEC 61439-1	NOTE	Harmonized as EN 61439-1
IEC 62368-1	NOTE	Harmonized as EN IEC 62368-1
ISO 13857:2019	NOTE	Harmonized as EN ISO 13857:2019 (not modified)

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Foreword to amendment A11

This document (EN IEC 62841-2-3:2021/A11:2021) has been prepared by CLC/TC 116 “Safety and environmental aspects of motor-operated electric tools”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2022-05-03
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2025-05-03

This document modifies by common modifications EN IEC 62841-2-3:2021, which consists of the text of 116/444/FDIS (future IEC 62841-2-3, Ed 1) prepared by IEC/TC 116 “Safety of motor-operated electric tools”.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This series is divided into four parts:

Part 1: General requirements which are common to most hand-held 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, 3 or 4: Requirements for particular types of tools which either supplement or modify the requirements given in Part 1 to account for the particular hazards and characteristics of these specific tools.

The Part 2-3 is to be used in conjunction with EN 62841-1:2015 and its amendments.

The Part 2-3 supplements or modifies the corresponding clauses in EN 62841-1:2015, so as to convert it into the European Standard: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders.

Where a particular subclause of Part 1 is not mentioned in Part 2-3, that subclause applies as far as relevant. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

— requirements: in roman type

— test specifications: *in italic type*

— notes: in smaller roman type.

The terms defined in Clause 3 are printed in **bold typeface**.

Subclauses, notes, tables and figures which are additional to those in Part 1 are numbered starting from 101.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62841-2-3:2020 are prefixed “Z”.

This document follows the overall requirements of EN ISO 12100.

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

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

Compliance with the clauses of Part 1 together with Part 2-3 provides one means of conforming with the essential health and safety requirements of the Directive concerned.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Annex ZA *of EN 62841-1:2015 is applicable, except as follows:*

Publication	Year	Title	EN/HD	Year
Addition:				
ISO 525	2013	Bonded abrasive products – General requirements	-	-
ISO 603-14	1999	Bonded abrasive products – Dimensions – Part 14: Grinding wheels for deburring and fettling/snagging on an angle grinder	-	-
ISO 603-16	1999	Bonded abrasive products – Dimensions – Part 6: Grinding wheels for cutting-off on hand-held power tools	-	-
-	-	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	EN ISO 11203	2009

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Annex ZZ
(informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC [2006 OJ L157] aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/396 to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 — Correspondence between this European Standard and Annex I of Directive 2006/42/EC

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s) / sub-clause(s) of this EN	Remarks / Notes:
1.1.2 (Principles of safety integration)	4	-
1.1.3 (Materials and products)	5, 6.1, 21.6, K.5, L.5, L.21	-
1.1.5 (Design of machinery to facilitate its handling)	19.4	-
1.1.6 (Ergonomics)	5, 19.5, 21.18.1, K.5, K.21.18.1.1, L.5, L.21	-
1.1.7 (Operating positions)	21.35, L.21	-
1.2.1 (Safety and reliability of control systems)	5, 18.6, 18.8, 23.1.6, 23.1.10, 23.1.11, 23.3, K.5, K.18.6, K.18.8, K.23.1.10, K.23.1.201, L.5, L.18, L.23.1.10	-
1.2.2 (Control devices)	5, 8.5, 8.9, 8.10, 8.11, 21.1, 21.2, 21.4, 21.17, 21.18, K.5, K.21.17.1.2, L.5, L.21	-
1.2.3 (Starting)	5, 21.17, K.5, K.21.17.1.2, L.5, L.21	-
1.2.4.1 (Normal stop)	5, 21.17, K.5, K.21.17.1.2, L.5, L.21	-
1.2.6 (Failure of the power supply)	5, 21.18.1.Z1, 23.3, K.5, L.5, L.21	-

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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s) / sub-clause(s) of this EN	Remarks / Notes:
1.3.2 (Risk of break-up during operation)	5, 8.14.2 c), 13.1, 14.4, 17, 19.6, 19.105, 20, 21.23, 24.11, 24.12, 24.13, 27, K.5, K.13.1, K.17, K.19.6, K.20, K.24.201, K.27.1, L.5, L.13.1, L.17, L.20, L.21, L.24.201, Annex CC	-
1.3.3 (Risk due to falling or ejected objects)	5, 18.3, 19.102, 19.103, 19.104, 20.101, 20.102, 20.103, 21.35, K.5, L.5, L.18, L.21	-
1.3.4 (Risks due to surfaces, edges or angles)	19.2, 21.24, L.21	-
1.3.6 (Risks related to variations in operating conditions)	19.101.2	-
1.3.7 (Risks related to moving parts)	5, 19.1, 19.101.1, 19.3, K.5, L.5	-
1.3.8.1 (Moving transmission parts)	5, 19.1, 19.3, K.5, L.5	-
1.3.8.2 (Moving parts involved in the process)	5, 19.1, 19.101.1, K.5, L.5	-
1.4.1 (General requirements (for guards and protective devices))	5, 19.1, 19.101, 20.1, 20.2, 20.3, 20.4, 20.101, 20.102, 20.103, 21.22, K.5, K.20.1, K.20.3, L.5, L.20, L.21, Annex AA	-
1.4.2.1 (Special requirements for fixed guards)	5, 19.1, 19.9, K.5, L.5	-
1.4.2.3 (Special requirements for adjustable guards restricting access)	5, 19.1, K.5, L.5	-
1.5.1 (Risks due to electricity supply)	5, 7, L.7.1, 9, 10, 11, 12, 14, 15, 16, 17, 18.1 to 18.7, 20.5, 21.3, 21.5 to 21.16, 21.19 to 21.22, 21.25 to 21.34, 22, 23.1.1 to 23.1.5, 23.1.7 to 23.1.9, 23.2, 23.4, 23.5, 24, 25, 26, 27, 28, K.5, K.7, K.9, K.10, K.11, K.12, K.14, K.16, K.17, K.18.1 to K.18.7, K.21.5 to K.21.16, K.21.19 to K.21.22, K.21.25 to K.21.34, K.22, K.24, K.25, K.26, K.27.1, K.28.1, K.28.2, L.5, L.9, L.10, L.11, L.12, L.14, L.16, L.17, L.18, L.18.201, L.20, L.21, L.22, L.24, L.25, L.26, L.28.1, Annex C	-
1.5.4 (Risks due to errors of fitting)	5, 8.7, 8.8, 8.13, 8.14.2, 21.7, 21.8, 21.19, 27.1, K.5, K.8.7, K.8.8, K.19.201, K.21.201, K.21.203, K.27.1, L.5, L.19.201, L.21.201, L.21.203, L.21	-
1.5.5 (Risks due to extreme temperatures)	5, 12.5, K.5, K.12.1, L.5	-

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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s) / sub-clause(s) of this EN	Remarks / Notes:
1.5.6 (Risks due to fire)	5, 13, 18.1, 18.2, 18.4, 18.6, 28.1, K.5, K.13, K.12.201, K.18.1, K.18.6, K.18.201, K.18.202, K.18.203, K.20.1, K.20.3, K.21.201, K.21.203, K.23.201, K.23.202, K.28.1, L.5, L.12.201, L.13, L.18, L.18.204, L.20.201, L.20.202, L.21.201, L.21.203, L.23.201, L.23.202, L.28.1, L.28.201	-
1.5.7 (Risks due to explosion)	5, K.5, K.12.201, K.18.201, K.18.202, K.18.203, K.19.202, K.20.1, K.20.3, K.21.202, K.21.203, L.5, L.12.201, L.18.202, L.18.203, L.18.204, L.19.202, L.20.201, L.20.202, L.21.202, L.21.203	-
1.5.8 (Noise reduction)	I.2.Z1	-
1.5.9 (Vibration reduction)	I.3.Z1	-
1.5.10 (Risks due to radiation)	5, 6.1, 6.3, K.5, L.5	-
1.5.11 (Risks due to external radiation)	5, 18.8, K.5, K.18.8 L.5, L.18.8	-
1.5.12 (Risks due to laser radiation)	6.2	-
1.5.13 (Risks due to emissions of hazardous materials and substances)	21.35, L.21	-
1.6.1 (Machinery maintenance)	24.1, K.21.18.Z101, L.21.18.Z101	-
1.6.3 (Isolation of energy sources)	24.1, K.21.18.Z101, L.21.18.Z101	-
1.7.1 (Information and warnings on machinery)	8.1, 8.2, 8.4, 8.6, K.8.1, K.8.4, L.8.1, L.8.4	-
1.7.2 (Warning of residual risks)	8.2, 8.4, K.8.4, L.8.4	-
1.7.3 (Marking of machinery)	8.3, 8.4, 8.12, K.8.3, K.8.4, L.8.3, L.8.4	-
1.7.4 (Instructions)	8.14	
1.7.4.1 (General principle for drafting of instructions)	8.14	-
1.7.4.2 (Contents of the instructions)	8.14.1, 8.14.2, 8.14.3, K.8.14.1.1, K.8.14.2, L.8.14.1.1, L.8.14.2	
1.7.4.3 (Sales literature)	-	Not covered

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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s) / sub-clause(s) of this EN	Remarks / Notes:
2.2.1 (General requirements for portable hand-held and/or hand-guided machinery)	5, 19.4, 19.5, 21.18.1, K5, L.5, L.21	-
2.2.1.1 (Instructions for portable hand-held and/or hand-guided machinery)	5, 8.14.2 Za) 3), I.3.6.2, K.5, L.5	-

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 2-3: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders

FOREWORD

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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62841-2-3 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

The text of this International standard is based on the following documents:

FDIS	Report on voting
116/444/FDIS	116/454/RVD

Full information on the voting for the approval of this International standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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This Part 2-3 is to be used in conjunction with the first edition of IEC 62841-1:2014.

This Part 2-3 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders.

Where a particular subclause of Part 1 is not mentioned in this Part 2-3, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– notes: in small roman type.

The terms in **bold typeface** in the text are defined in Clause 3

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

The contents of the corrigendum of April 2021 have been included in this copy.

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ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 2-3: Particular requirements for hand-held grinders, disc-type polishers and disc-type sanders

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to hand-held **grinders**, **disc-type polishers** and **disc-type sanders**, including angle, straight and vertical tools, intended for use on various materials except magnesium, with a **rated capacity** not exceeding 230 mm. For **grinders**, the **rated no-load speed** does not exceed a peripheral speed of the **accessory** of 80 m/s at **rated capacity**.

This standard does not apply to dedicated cut-off machines.

NOTE 101 It is planned that a document on cut-off machines will be published.

This standard does not apply to orbital polishers and orbital sanders.

NOTE 102 It is planned that a document on orbital polishers and orbital sanders will be published.

This standard does not apply to die grinders.

NOTE 103 Die grinders are covered by IEC 62841-2-23.

A11 This document covers all significant hazards, hazardous situations or hazardous events relevant for tools covered by this standard.

NOTE Essential requirements not mentioned in Table ZZ.1 are deemed to be not applicable, because the corresponding hazards are either not relevant for machines covered by this standard or do not require specific action by the designer. A11

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

ISO 525:2013, *Bonded abrasive products – General requirements*

A11 ISO 603-14:1999, *Bonded abrasive products — Dimensions — Part 14: Grinding wheels for deburring and fettling/snagging on an angle grinder*

ISO 603-16:1999, *Bonded abrasive products — Dimensions — Part 16: Grinding wheels for cutting-off on hand-held power tools* A11

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

3.101
blotter
thin piece of an easily compressible material, between the abrasive product and **flange**

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3.102
diamond wheel
metal wheel with continuous or segmented diamond abrasives

3.102.1
diamond cutting wheel
metal wheel with the abrasives located on the periphery of the wheel

3.102.2
diamond grinding wheel
metal wheel with abrasives located on the face of the wheel

3.103
disc-type polisher
tool equipped with a rotating flexible disc or pad intended for polishing

Note 101 to entry: Polishing is an operation to produce a smooth or shiny surface.

3.104
disc-type sander
tool, constructed like a **grinder**, intended for sanding

Note 101 to entry: Sanding is an operation to remove material using flexible abrasive material, such as sandpaper.

3.105
flange
collar, disc or plate between or against which wheels are mounted

3.105.1
unrecessed (flange)
flange fixed to the machine spindle having an **unrecessed** flat surface against which a threaded hole abrasive product is screwed, e.g. a cup wheel, a cone or a plug

3.105.2
inner flange
flange which contacts and provides support to the back side of the wheel and is located on the spindle between wheel and tool

3.105.3
outer flange
flange which supports the front side of the wheel and secures and clamps the wheel to the spindle and the **inner flange**

Note 101 to entry: In Canada and the United States of America, the following additional definition applies:

3.105.UC1
adaptor backing flange
inner flange which contacts and supports in the hub area and extends past the raised portion to reduce the flexing of the wheel periphery

3.106
grinder
tool driving a rotating spindle on which a bonded abrasive product or a **diamond wheel** is mounted

3.106.1
angle grinder
grinder with the rotating spindle at an angle to the axis of the tool body which acts as a grasping surface, intended for peripheral and lateral grinding

Note 101 to entry: See Figure 101.

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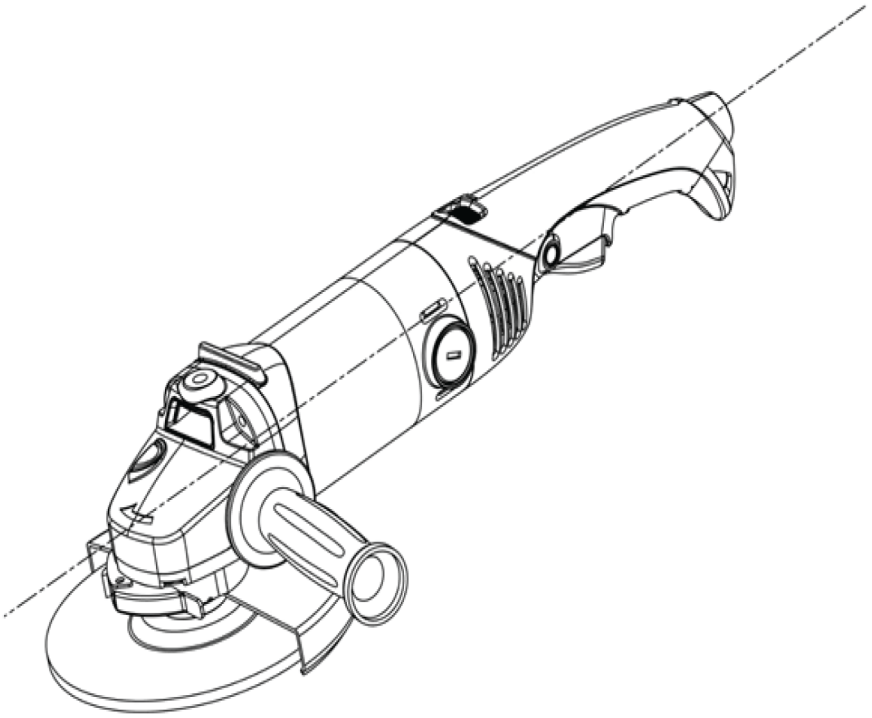


Figure 101 – Example of an angle grinder

3.106.2
straight grinder
grinder with the rotating spindle in-line with the axis of the tool body which acts as a grasping surface, intended for peripheral grinding only and not equipped with a collet or chuck

Note 101 to entry: See Figure 102.

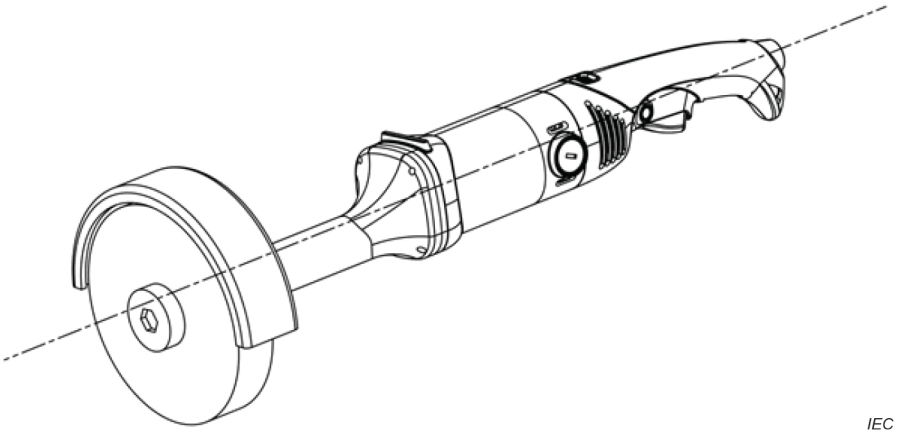


Figure 102 – Example of a straight grinder

3.106.3
vertical grinder
grinder with the rotating spindle in-line with the axis of the tool body and with handles that are substantially perpendicular to the axis of the rotating spindle, intended for peripheral and lateral grinding

Note 101 to entry: See Figure 103.

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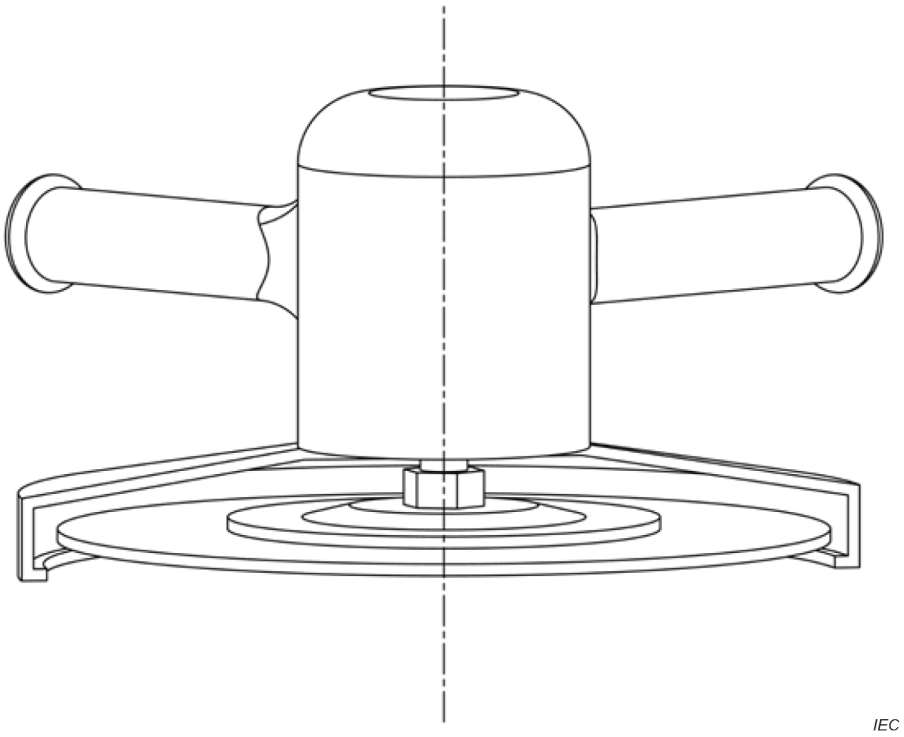


Figure 103 – Example of a vertical grinder

3.107
guide plate
flat plate on the machine which rests on the material to be cut

3.108
guide roller
roller on the machine which rests on the material to be cut

3.109
minor fragment
particles less than 1/16 of the mass of the abrasive wheel

3.110
rated capacity
maximum diameter of the rotating **accessory** to be fitted on the tool as specified by the manufacturer's instruction

3.111
wheel guard
device which partly encloses the abrasive wheel and gives protection to the operator

3.112
wheel types
alphanumeric designation of wheels based upon application and shape

Note 101 to entry: Shapes for **wheel types** are given in Annex CC.

4 General requirements

This clause of Part 1 is applicable.

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5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 *Addition:*

*The mass of a **grinder** includes the **wheel guard**, the **flanges** and the handles.*

*The mass of a **disc-type polisher** or **disc-type sander** includes the **flanges** and the handles.*

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.1 *Addition:*

Tools shall also be marked with:

– **rated no-load speed**;
– **rated capacity**.

NOTE 101 The requirement for marking **rated capacity** does not prohibit the additional marking of smaller permitted diameters of the rotating **accessory** other than **rated capacity** (e.g. 115 mm / 125 mm, where 125 mm is the **rated capacity**).

8.2 *Addition:*

Tools shall also be marked with:

"**WARNING** Always wear eye protection" or sign M004 of ISO 7010 or the following safety sign:



The eye protection symbol may be modified by adding other personal protective equipment such as ear protection, dust mask, etc.

Tools that require at least two handles in accordance with 19.4 shall be marked with

– "**WARNING** Always operate with two hands"; or
– the following safety sign:

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NOTE In Canada and the United States of America, the following additional requirements apply:

Tools shall be marked with the following additional safety warnings:

– "WARNING – To reduce the risk of injury, use only accessories rated at least equal to the maximum speed marked on the tool."

In Canada, the equivalent French wording of the above warning is as follows: “AVERTISSEMENT – Pour réduire le risque de blessure, utiliser uniquement les accessoires convenant au moins à la vitesse maximale inscrite sur l’outil.”

All **grinders** required to have a **wheel guard** by 19.101.2 shall be marked with the following warning:

– “WARNING – To reduce the risk of injury, always use proper guards when grinding.”

In Canada, the equivalent French wording of the above warning is as follows: “AVERTISSEMENT – Pour réduire le risque de blessure, utiliser toujours les protecteurs appropriés pendant le meulage.”

If the above cautionary markings are included as part of a list of cautionary markings, the words “WARNING – To reduce the risk of injury” need not be repeated.

8.2.101 A Type B **wheel guard** in accordance with Annex AA shall be marked with

– “ **WARNING** Not for cut-off operations”; or

– the following safety sign:



8.3 *Addition:*

Tools provided with a threaded spindle intended to accept threaded **accessories** in accordance with 8.14.2 shall be marked with the spindle thread size.

The direction of rotation of the spindle shall be indicated on the tool by an arrow, raised or recessed or by any other means no less visible and indelible.

8.6 *Addition:*



always operate with two hands



do not use the guard for cut-off operations

8.12 *Addition:*

The safety sign required by 8.2.101 need not be in accordance with the red colour requirements of ISO 3864-2.

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8.14.1.101 Additional safety instructions for grinders, disc-type polishers and disc-type sanders

8.14.1.101.1 General

The additional safety instructions as specified in 8.14.1.101.2 to 8.14.1.101.8 shall be given. This part may be printed separately from the "General Power Tool Safety Warnings".

In these safety instructions, terms such as grinding/**grinder**, sanding/sander, wire brushing/wire brush, polishing/polisher or cutting-off/cut-off tool are selected as specified by the manufacturer. These terms in the warnings and headings shall be consistently used or deleted based on the selected operations. The “and”/“or” conjunctions may be used as appropriate.

If the power tool is intended only for one of the listed operations, the heading of that section is to be used for all warnings.

8.14.1.101.2 Safety instructions for all operations

Safety warnings common for grinding, sanding, wire brushing, polishing or cutting-off operations:

NOTE 101 In the above heading, those operations not applicable are omitted.

a) **This power tool is intended to function as a grinder, sander, wire brush, polisher, hole cutter or cut-off tool. Read all safety warnings, instructions, illustrations and specifications provided with this power tool**. *Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury*.

NOTE 102 Only the applicable operations are listed.

b) **Operations such as grinding, sanding, wire brushing, polishing, hole cutting or cutting-off are not to be performed with this power tool**. *Operations for which the power tool was not designed may create a hazard and cause personal injury*.

NOTE 103 Only those operations are listed that were not included in the first warning. If all listed operations are intended, then this warning is omitted, but all subsequent warnings are given without exclusion.

c) **Do not convert this power tool to operate in a way which is not specifically designed and specified by the tool manufacturer**. *Such a conversion may result in a loss of control and cause serious personal injury*.

d) **Do not use accessories which are not specifically designed and specified by the tool manufacturer**. *Just because the accessory can be attached to your power tool, it does not assure safe operation*.

e) **The rated speed of the accessory must be at least equal to the maximum speed marked on the power tool**. *Accessories running faster than their rated speed can break and fly apart.*

f) **The outside diameter and the thickness of your accessory must be within the capacity rating of your power tool**. *Incorrectly sized accessories cannot be adequately guarded or controlled.*

g) **The dimensions of the accessory mounting must fit the dimensions of the mounting hardware of the power tool**. *Accessories that do not match the mounting hardware of the power tool will run out of balance, vibrate excessively and may cause loss of control*.

h) **Do not use a damaged accessory. Before each use inspect the accessory such as abrasive wheels for chips and cracks, backing pad for cracks, tear or excess wear, wire brush for loose or cracked wires. If power tool or accessory is dropped, inspect for damage or install an undamaged accessory. After inspecting and installing an accessory, position yourself and bystanders away from the plane of the rotating accessory and run the power tool at maximum no-load speed for one minute.** *Damaged accessories will normally break apart during this test time*.

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