

BS EN 60745-2-22:2011+A11:2013



BSI Standards Publication

# Hand-held motor-operated electric tools — Safety

Part 2-22: Particular requirements for cut-off machines

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## National foreword

This British Standard is the UK implementation of EN 60745-2-22:2011+A11:2013. It is derived from IEC 60745-2-22:2011. It supersedes BS EN 60745-2-22:2011, which will be withdrawn on 17 December 2015.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by tags (e.g. [C] [C]).

Where a common modification has been introduced by amendment, the tags carry the number of the amendment. For example, the common modifications introduced by CENELEC amendment A11 are indicated by [C11] [C11] tags.

The UK participation in its preparation was entrusted by Technical Committee CPL/116, Safety of motor-operated electric tools, to Subcommittee CPL/116/2, Safety of electric motor-operated hand-held tools.

A list of organizations represented on this subcommittee 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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## Amendments/corrigenda issued since publication

| Date        | Text affected                                |
|-------------|----------------------------------------------|
| 31 May 2013 | Implementation of CENELEC amendment A11:2013 |

**Hand-held motor-operated electric tools -  
Safety -  
Part 2-22: Particular requirements for cut-off machines  
(IEC 60745-2-22:2011, modified)**

Outils électroportatifs à moteur -  
Sécurité -  
Partie 2-22: Règles particulières pour les  
tronçonneuses à disques  
(CEI 60745-2-22:2011, modifiée)

Handgeführte motorbetriebene  
Elektrowerkzeuge -  
Sicherheit -  
Teil 2-22: Besondere Anforderungen für  
Trennschleifmaschinen  
(IEC 60745-2-22:2011, modifiziert)

This European Standard was approved by CENELEC on 2011-04-18. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

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## Foreword

The text of document 116/57/FDIS, future edition 1 of IEC 60745-2-22, prepared by IEC TC 116, Safety of hand-held motor-operated electric tools, was submitted to the IEC-CENELEC parallel vote.

A draft amendment, prepared by the Technical Committee CENELEC TC 116, Safety of motor-operated electric tools, was submitted to the formal vote.

The combined texts were approved by CENELEC as EN 60745-2-22 on 2011-04-18.

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) 2012-04-18
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2014-04-18

This European Standard is divided into two 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: 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.

This draft 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 EC Directive 2006/42/EC. See Annex ZZ.

Compliance with the clauses of Part 1 together with this Part 2-22 provides one means of conforming with the essential health and safety requirements of the Directive concerned.

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

This European Standard follows the overall requirements of EN ISO 12100-1 and EN ISO 12100-2.

This Part 2-22 is to be used in conjunction with EN 60745-1:2009. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

Subclauses and figures which are additional to those in Part 1 are numbered starting from 101; additional annexes are lettered AA, BB, etc.

Subclauses, tables and figures which are additional to those in IEC 60745-2-22 are prefixed "Z".

Annexes ZA and ZZ have been added by CENELEC.

NOTE In this standard, the following print types are used:

- Requirements: in roman type;
- *Test specification: in italic type;*
- Notes: in smaller roman type.

## Endorsement notice

The text of the International Standard IEC 60745-2-22:2011 was approved by CENELEC as a European Standard with agreed common modifications.

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

|               |                                  |
|---------------|----------------------------------|
| IEC 60745-2-3 | NOTE Harmonized as EN 60745-2-3. |
| IEC 60745-2-5 | NOTE Harmonized as EN 60745-2-5. |

## Foreword to amendment 11

This document (EN 60745-2-22:2011/A11:2013) has been prepared by CLC/TC 116 "Safety of motor-operated electric tools".

The following dates are fixed:

- latest date by which this document has to be implemented (dop) 2013-12-17  
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with (dow) 2015-12-17  
this document have to be withdrawn

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60745-2-22:2011 are prefixed "Z".

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 2006/42/EC.

**Annex ZA**  
(normative)

**Normative references to international publications  
with their corresponding European publications**

*Addition:*

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                                        | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|
| EN 1339            | 2003        | Concrete paving flags -<br>Requirements and test methods                                                                            | -            | -           |
| ISO 603-15         | 1999        | Bonded abrasive products - Dimensions -<br>Part 15: Grinding wheels for cutting-off on<br>stationary or mobile cutting-off machines | -            | -           |
| ISO 603-16         | 1999        | Bonded abrasive products - Dimensions -<br>Part 16: Grinding wheels for cutting-off on<br>hand held power tools                     | -            | -           |

## **Annex ZZ** (informative)

### **Coverage of Essential Requirements of EC Directives**

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.

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## HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY –

### Part 2-22: Particular requirements for cut-off machines

#### 1 Scope

This clause of Part 1 is applicable as follows:

*Addition:*

This standard applies to **cut-off machines** fitted with

- one **bonded reinforced wheel** of Type 41 or Type 42, or
- one or more **diamond cut-off wheels** with the peripheral gaps, if any, not exceeding 10 mm

and with

- a **rated speed** not exceeding a peripheral speed of the wheel of 100 m/s at **rated capacity** and
- a rated wheel capacity range of 55 mm to 410 mm.

These machines are intended to cut materials such as metals, concrete, masonry, glass and tile.

This standard does not apply to:

- grinders, sanders, or polishers, even if they can be converted to a **cut-off machine**, which are covered by IEC 60745-2-3;
- circular saws which are covered by IEC 60745-2-5.

#### 2 Normative references

This clause of Part 1 is applicable except as follows:

*Addition:*

EN 1339:2003, *Concrete paving flags – Requirements and test methods*

ISO 603-15:1999, *Bonded abrasive products – Dimensions – Part 15: Grinding wheels for cutting-off on stationary or mobile cutting-off machines*

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

#### 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

### 3.102

#### **flange**

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

#### 3.102.1

##### **flange outside diameter**

outside diameter of the contact surface of a **flange**

#### 3.102.2

##### **backing flange**

part that contacts and provides support to the back side of the wheel and is located on the spindle between wheel and tool

#### 3.102.3

##### **locking flange**

part that supports the front side of the wheel and secures and clamps the wheel to the spindle and the **backing flange**

### 3.103

#### **cut-off machine**

tool driving a rotating spindle, with a **guide plate** or **guide roller** or similar means, on which a **bonded reinforced wheel** or **diamond wheel** is mounted and used for peripheral grinding

### 3.104

#### **rated capacity**

maximum intended diameter of the rotating accessory to be fitted on the tool as recommended by the manufacturer's instruction

### 3.105

#### **rated speed**

maximum attainable speed as designated by the manufacturer, with any recommended accessory installed, at rated voltage or at the upper limit of the rated voltage range

### 3.106

#### **wheel guard**

device which partly encloses the wheel and gives protection to the operator

### 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

#### **bonded reinforced wheel**

wheels for different applications in accordance with ISO 603-15 and ISO 603-16

### 3.110

#### **diamond wheel**

metal wheels with a continuous or segmented abrasive rim

### 3.Z101

#### **wall chaser**

tool driving a rotating spindle, with a **guide plate** or **guide roller** or similar means, on which one or more **diamond wheels** are mounted and used for non-through cutting operations by peripheral grinding 

## 4 General requirements

This clause of Part 1 is applicable.

## 5 General conditions for the tests

This clause of Part 1 is applicable.

## 6 Environmental requirements

This clause of Part 1 is applicable except as follows: 

### 6.1.2.4 *Modification:*

Cut-off machines and wall chasers are held and used as specified in 6.1.2.5.

For cut-off machines and wall chasers, the concrete block, its support and the tool shall be so arranged that the geometric centre of the tool is 1 m above the reflecting plane, see Figure Z102 (dimension “y”) and Figure Z104.

For cut-off machines, the centre of the 200 mm projecting end of the concrete slab shall be located under the top microphone.

For wall chasers the centre of the concrete block shall be located under the top microphone.

### 6.1.2.5 *Modification:*

Cut-off machines are tested under load observing the conditions shown in Table Z101. Wall chasers are tested under load observing the conditions shown in Table Z102. 



**Table Z101 — Noise and vibrations test conditions for cut-off machines**

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Material and set up</b> | <p>Concrete slab with minimum dimensions of 400 mm x 600 mm and a thickness of <math>(50 \pm 5)</math> mm according to EN 1339. The concrete slab shall be stored under dry conditions for at least 28 days and have the following specifications in accordance with the following clauses of EN 1339: Class 3 (5.3.3.2), Class 4 (5.3.4.2), Class 70 (5.3.6.2).</p> <p>The concrete slab is rigidly fixed on a supporting concrete block with the minimum dimensions of 800 mm x 500 mm x 200 mm.</p> <p>At the beginning of the test the end of the concrete slab shall project 200 mm from the concrete block and shall be readjusted at least after each series of tests.</p> <p>Unless the machine is intended for operation with water supply, the dust shall be collected during operation using a vacuum system. This shall be in place and fitted correctly. The hose for dust extraction shall be connected and have adequate length to eliminate the influence of the noise and vibration from the vacuum system on the tool measurements.</p> <p>See Figures Z102 and Z103.</p> |
| <b>Orientation</b>         | <p>Cut the concrete slab across the 400 mm width. During cutting the entire surface of the guide plate or all guide rollers shall be in contact with the concrete slab.</p> <p>The cut shall not be less than 20 mm from the edge of the slab.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Tool bit/settings</b>   | <p>New wheel(s) as specified for cutting concrete at the beginning of the entire test, to be used by all three operators.</p> <p>Speed setting devices, if any, shall be adjusted to the setting specified for cutting-off concrete.</p> <p>The depth gauge, if any, shall be adjusted to a cutting depth equal to the thickness of the slab(s) plus 40 mm.</p> <p>If no depth gauge is provided, the cut shall be made with a cutting depth of the slab(s) plus approximately 10 mm to 40 mm.</p> <p>If the maximum cutting depth of the cut-off machine is less than the values above, the test is conducted at maximum cutting depth.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Feed force</b>          | <p>The forces applied to the tool shall be sufficient to obtain rated input/current <math>\pm 10\%</math> during cutting, applying approximately equal forces to both handles.</p> <p>If either the input/current above cannot be achieved or the test cycle is less than 15 s, the test shall be conducted on two slabs stacked together.</p> <p>Excessive grip forces shall be avoided.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Test cycle</b>          | <p>One cut across the 400 mm width of the concrete slab.</p> <p>The noise is measured during 15 s when the tool is in the middle of the concrete slab.</p> <p>For vibration, the measurement starts when the wheel enters the concrete slab and finishes when the wheel leaves the slab.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

