IEC 60745-2-15

Edition 2.1 2009-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Hand-held motor-operated electric tools – Safety –
Part 2-15: Particular requirements for hedge trimmers

Outils électroportatifs à moteur – Sécurité –
Partie 2-15: Règles particulières pour les taille-haies

IEC 60745-2-15:2006+A1:2009

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FOREWORD

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International Standard IEC 60745-2-15 has been prepared by subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

Main changes include Clause 8: Markings and instructions, introducing detailed safety warnings; Clause 19: Mechanical hazards, with requirements for handles, hand protection, cutting device, blade stopping time, lower barrier, cutting device cover; and Clause 21: Construction, with requirements for blade controls (switches) and insulation of knobs and handles.

This consolidated version of IEC 60745-2-15 consists of the second edition (2006) [documents 61F/626/FDIS and 61F/638/RVD] and its amendment 1 (2009) [documents 116/10/FDIS and 116/16/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

The amendment modifies the present part 2-15 to ensure its conformity with the fourth edition (2006) of IEC 60745-1, *Hand-held motor-operated electric tools – Safety – Part 1: General requirements*

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

This part 2 is to be used in conjunction with the latest edition of IEC 60745-1*, Hand-held motor-operated electric tools – Safety – Part 1: General requirements,* and its amendments. It was established on the basis of the fourth edition (2006) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60745-1.

This part 2 supplements or modifies the corresponding clauses of IEC 60745-1, so as to convert that publication into the IEC standard: Safety requirements for hedge trimmers.

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

NOTE 2 The following numbering system is used:

– subclauses, items, tables and figures that are numbered starting from 101 are additional to those in Part 1;

– additional annexes are lettered AA, BB, etc.

NOTE 3 In this standard, the following print types are used:

– requirements: in roman type;

– *test specifications: in italic type*;

– notes: in smaller roman type.

IEC 60745 consists of the following parts, under the general title *Hand-held motor-operated electric tools – Safety:*

Part 1: General requirements
Part 2-1: Particular requirements for drills and impact drills
Part 2-2: Particular requirements for screwdrivers and impact wrenches
Part 2-3: Particular requirements for grinders, polishers and disk-type sanders
Part 2-4: Particular requirements for sanders and polishers other than disk type
Part 2-5: Particular requirements for circular saws
Part 2-6: Particular requirements for hammers
Part 2-7: Particular requirements for spray guns for non-flammable liquids
Part 2-8: Particular requirements for shears and nibblers
Part 2-9: Particular requirements for tappers
Part 2-11: Particular requirements for reciprocating saws (jig and sabre saws)

Part 2-12: Particular requirements for concrete vibrators
Part 2-13: Particular requirements for chain saws
Part 2-14: Particular requirements for planers
Part 2-15: Particular requirements for hedge trimmers
Part 2-16: Particular requirements for tackers
Part 2-17: Particular requirements for routers and trimmers
Part 2-18: Particular requirements for strapping tools
Part 2-19: Particular requirements for jointers
Part 2-20: Particular requirements for band saws
Part 2-21: Particular requirements for drain cleaners

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result 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.

HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY –

Part 2-15: Particular requirements for hedge trimmers

1 Scope

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

1.1 *Addition:*

This standard applies to hedge trimmers which are designed for use by one operator for trimming hedges and bushes, utilizing one or more linear reciprocating cutter blades.

This standard is not applicable to hedge trimmers with a rotating blade.

2 Normative references

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

Addition:

ISO 3864-3[1], *Graphical symbols – Safety colours and safety signs – Part 3: Design criteria for graphical symbols used in safety signs*

3 Terms and definitions

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

3.101
blade tooth
part of the cutter blade which is sharpened or has sharp edges to perform the shearing action (see Figures 101 and 102)

3.102
cutter blade
part of the cutting device having blade teeth which cut by shearing action either against other blade teeth or against a shear plate (see Figures 101 and 102)

3.103
cutting device
part of the assembly of cutter blade and shear plate or of two cutter blades together with any supporting part which performs the cutting action. This may be either single or double sided (see Figures 101 and 102)

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[1] ISO 3864-2 is currently in DIS state.

3.104
cutting length
effective cutting length of the cutting device measured from the inside edge of the first blade tooth or shear plate tooth to the inside edge of the last blade tooth or shear plate tooth (see Figure 103). Where both blades move, the cutting length is measured when the first and last teeth are furthest apart

3.105
front handle
handle located at or towards the cutting device (see Figure 104)

3.106
rear handle
handle located furthest from the cutting device (see Figure 104)

3.107
blade control
device activated by the operator's hand or fingers for controlling the blade movement

3.108
blunt extension
blunt part of the cutting device or a part of an unsharpened plate fitted to the cutting device which extends beyond the blade teeth (see Figures 101 and 102)

3.109
blade stopping time
elapsed time from the release of the blade control until the cutter blade stops

3.110
maximum speed
highest motor speed obtainable when adjusted in accordance with the manufacturer's specifications and/or instructions and with the cutting device engaged

3.111
shear plate
part of the cutting device which assists cutting by shearing action against a cutter blade (see Figure 101)

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

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

5.2 *Addition:*

For the test of 19.104, one additional sample may be provided.

6 Void

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:*

Hedge trimmers shall be marked with safety recommendations and warnings of the following substance, which shall be written in one of the official languages of the country in which the tool is to be sold. Alternatively, they shall be marked with symbols of the type specified in Annex AA.

For hedge trimmers with a degree of protection of less than IPX4:

– "Do not expose to rain."

For mains supplied tools:

– "Remove plug from the mains immediately if the cable is damaged or cut."

If other symbols are used they shall be in accordance with ISO 3864-3.

8.12.1.1 *Addition:*

Hedge trimmer safety warnings:

- **Keep all parts of the body away from the cutter blade. Do not remove cut material or hold material to be cut when blades are moving. Make sure the switch is off when clearing jammed material.** *A moment of inattention while operating the hedge trimmer may result in serious personal injury.*
- **Carry the hedge trimmer by the handle with the cutter blade stopped. When transporting or storing the hedge trimmer always fit the cutting device cover**. *Proper handling of the hedge trimmer will reduce possible personal injury from the cutter blades.*
- **Hold the power tool by insulated gripping surfaces only, because the cutter blade may contact hidden wiring or its own cord.** *Cutter blades contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.*
- **Keep cable away from cutting area.** *During operation the cable may be hidden in shrubs and can be accidentally cut by the blade.*

8.12.2.b) *Addition:*

101) Advice to check the hedge for foreign objects, e.g. wire fences

102) Recommendation for the use of a residual current device with a tripping current of 30 mA or less

103) Instruction to hold the hedge trimmer properly, e.g. with both hands if two handles are provided

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

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

12.4 *Replacement:*

The tool is operated at rated input or rated current for 30 min. The temperature rises are measured at the end of the 30 min.

13 Leakage current

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable.

15 Electric strength

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

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

17.2 *Addition:*

During the test, the cutting device is lubricated as necessary to prevent undue friction.

18 Abnormal operation

This clause of Part 1 is applicable.

19 Mechanical hazards

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

19.1 *Addition:*

The requirements of this subclause do not apply to those moving parts and guards which are separately covered by 19.102 and 19.103.

19.101 Handles

The number of handles shall be in accordance with Table 101.

The handles shall be designed in such a way that each one can be grasped with one hand. The gripping surface shall be at least 100 mm long. On bail or closed handles (U-shaped handles) this dimension is related to the inner width of the gripping surface. On straight handles it is the complete length between the housing and the end of the handle. There shall be a minimum radial clearance of 25 mm around the gripping length.

If a part containing the motor complies with the dimensions above it may be considered as a handle.

The gripping length of a bail or closed handle comprises any length that is straight or curved at a radius of greater than 100 mm together with any blend radius but not more than 10 mm at either or both ends of the gripping surface.

If a straight handle is supported centrally (i.e. T type) the gripping length shall be calculated as follows:

– for handles with a periphery (not including the support) of less than 80 mm the gripping length is the sum of the two parts on either side of the support;
– for handles with a periphery (not including the support) of 80 mm or more the gripping length is the complete length from end to end.

If applicable, the part of the handle containing the blade control actuator shall be counted as part of the handle gripping length. Finger grip or similar superimposed profiles shall not affect the method of calculating handle gripping length.

Handles shall be positively locked in position. If they are adjustable in different positions it shall not be possible to lock them in a position which contravenes other provisions of this standard.

For handles which are adjustable without the use of a tool, it shall not be possible to alter the handle position when the cutting device is operating. When altering the handle position the cutting device shall be inoperable.

Compliance is checked by inspection and measurements.

19.102 Hand protection

From any handle it shall not be possible to touch the moving cutter blade with the fingers spread out.

Compliance is checked by the following test.

The requirements are met if all the handles are located so that the test distance from the cutter blade of any handle is not less than 120 mm as shown in Figure 105.

If there is a guard, then the x_1 and x_2 distances shall be measured along the shortest path from the backside of the handle, via the edge of the blade guard, to the nearest cutting edge of the cutter blade.

19.103 Cutting device

To safeguard against contact with the cutter blade, hedge trimmers shall be constructed to meet the requirements of one of the categories given in Table 101.

Table 101 – Hedge trimmer categories

Items with requirements	Category number and requirements			
	1	2	3	4
Cutting length	≤ 200 mm	> 200 mm	> 200 mm	> 200 mm
Number of handles	1	2	2	2
Number of handles with blade control	1 (rear handle)	1 (rear handle)	1 (rear handle)	2
Maximum blade stopping time (subclause 19.104)	No	No	3 s	1 s
Blade configuration figure	106	106	107	108
Lower barrier (subclause 19.105)	No	No	Yes	No

For category 3, the 19 mm test probe in Figure 107 shall not contact any blade tooth.

Blunt extensions shall extend over the full length of the cutting device for the blade configurations according to Figures 106 and 107. For cutting devices with blade configurations as shown in Figure 108, the blunt extensions shall reach a distance of at least 400 mm from any point of the rear face of the front handle (see Figure 109). If the front handle is located part way along the cutting device the blunt extensions shall start at the first blade tooth and continue until the 400 mm minimum distance beyond the rear of the front handle is reached.

Blunt extensions are not required for tools of category 4 with a blade configuration as shown in Figure 108 where there are only two handles and the front handle is permanently fixed to the smooth side of a single sided cutting device.

To provide blade visibility during use, at least 50 % of the area of the top surface of the cutting device of category 3 tools, excluding areas occupied by a warning label and the surfaces wiped by blade motion, shall be coloured with a highly visible durable bright-red, -yellow or –orange colour which sharply contrasts with green. The coloured portion shall extend for at least 90 % of the length of the cutting device measured from the outboard end.

Compliance is checked by inspection and measurement.

19.104 Blade stopping time

The cutting device stopping mechanism shall meet the stop time requirement (see Table 101), with the hedge trimmer adjusted and lubricated as recommended by the manufacturer.

Compliance is checked by the test of 19.104.2 carried out in accordance with 19.104.1.

19.104.1 *The hedge trimmer shall be mounted and instrumented in such a manner that the results of the test are not affected. If an external starting device is used it shall not influence the results.*

The means for operating the hedge trimmer during the test shall be such that the blade control is released abruptly from the full "on" position and returns to the "off" position by itself. A device to detect the moment of release of the blade control shall be provided.

The running speed of the hedge trimmer during the test shall be the maximum speed.

Tachometers shall have an accuracy of ±2,5 % and the time recording measurement system shall have a total accuracy of ±25 ms.

Each cycle shall consist of the following sequence:

- *accelerate the blade from rest to the maximum speed (time t_s);*
- *hold it at this speed for a short time to ensure that it is stable (time t_r);*
- *release the blade control and allow the blade to come to rest (time t_b);*
- *allow a short time at rest before commencing the next cycle (time t_o).*

If the total time for one cycle is t_c then $t_c = t_s + t_r + t_b + t_o$. The test cycle times for "on" (t_s+t_r) and "off" (t_b+t_o) shall be decided by the manufacturer but shall not exceed 100 s "on" and 20 s "off".

NOTE This test is not representative for normal use and therefore the cycle times are specified by the manufacturer to avoid unnecessary wear or damage to the machine.

Ten "on/off" operations of the blade control shall be carried out prior to the test, the cutting device and stopping mechanism being adjusted in accordance with the manufacturer's instructions.

Stopping time is measured from the moment of release of the blade control until the cutter blade has reached the end of the last full stroke. Where there are two blade controls half the test cycles and stop time measurements shall be carried out on each.

19.104.2 *For hedge trimmers where the stopping mechanism can be adjusted and maintained and the manufacturer instructs the user to have this carried out at regular intervals, the test sequence shall consist of a total of 300 cycles. Measurement of the stopping time of the cutter blades shall be made for the first 6 cycles of each 50 cycles of operation and the final 6 cycles of the test sequence. During the test no adjustments shall be made.*

For hedge trimmers where the stopping mechanism is not adjustable, the test sequence shall consist of a total of 2 506 cycles. Measurement of the stopping time of the cutter blade shall be made for the first 6 cycles of each 500 cycles of operation and the final 6 cycles of the test sequence. The hedge trimmer shall be lubricated in accordance with the manufacturer's instructions.