

# INTERNATIONAL STANDARD

**IEC**  
**60335-2-92**

First edition  
2000-05

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## **Safety of household and similar appliances –**

### **Part 2-92:**

### **Particular requirements for pedestrian-controlled mains-operated lawn scarifiers and aerators**

### *Sécurité des appareils électrodomestiques et analogues –*

#### *Partie 2-92:*

#### *Règles particulières applicables aux scarificateurs de gazon et aux aérateurs fonctionnant sur le réseau et pour conducteur à pied*

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For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

\* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –**

**Part 2-92: Particular requirements for pedestrian-controlled mains-operated lawn scarifiers and aerators**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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This part of International Standard IEC 60335 has been prepared by IEC subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

It forms the first edition of IEC 60335-2-92.

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

FDIS	Report on voting
61F/320/FDIS	61F/344/RVD

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

This part 2-92 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the third edition (1991) of that standard.

This part 2-92 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert it into the IEC standard: Safety requirements for pedestrian-controlled mains-operated lawn scarifiers and aerators.

Where a particular subclause of part 1 is not mentioned in this part 2-92, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text in part 1 is to be adopted accordingly.

NOTE 1 The following print type are used:

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

Words in **bold** in the text are defined in clause 2. When a definition of part 1 concerns an adjective, the adjective and the associated noun are also in **bold**.

NOTE 2 Subclauses which are additional to those in part 1 are numbered starting from 101.

A bilingual version of this publication may be issued at a later date.

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## SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –

### Part 2-92: Particular requirements for pedestrian-controlled mains-operated lawn scarifiers and aerators

#### 1 Scope

This clause of part 1 is replaced by:

This International Standard deals with the safety of **pedestrian-controlled** mains-operated electrical lawn scarifiers and aerators with rotating cutters for regenerating lawns by, for instance, combing out grass thatch and moss, or by cutting vertically into the lawn face. These scarifiers are designed primarily for use at and around the home or for similar purposes, their rated voltage being not more than 250 V single phase.

This International Standard does not apply to **lawnmowers** (IEC 60335-2-77), **lawn trimmers** (IEC 60335-2-91), **lawn edge trimmers** (IEC 60335-2-91), **lawn edgers**, **flail mowers**, **sickle-bar mowers** or **agricultural mowers**.

This standard does not, in general, take into account:

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE Attention is drawn to the fact that

- for appliances intended to be used in tropical countries special requirements may be necessary;
- in many countries additional requirements are specified by the national authorities responsible for the protection of labour.

#### 2 Definitions

This clause of part 1 is applicable except as follows:

##### 2.2.9 Replacement:

##### **normal operation**

operation of the appliance under the following conditions: the appliance is operated at rated voltage with the load necessary to attain rated power input

##### 2.101

##### **braking system**

a combination of one or more brakes and related means of operation and control

##### 2.102

##### **catcher**

a part or combination of parts which provides a means for collecting grass, thatch, moss or other debris

##### 2.103

##### **control**

a means or device which will control the operation of the appliance or any specific operating function thereof



**2.104****cutting means**

for the purpose of this standard, the mechanism used to provide the cutting action of a scarifier or aerator

**2.105****cutting means enclosure (housing):**

the part of the assembly which provides the protective means around the **cutting means**

**2.106****cutting means tip circle**

the path described by the outermost point of the **cutting means** as it rotates about its shaft axis.

**2.107****cutting position**

any setting of the **cutting means** designated by the manufacturer

**2.108****cutting width**

the width of cut measured across the **cutting means** at right angles to the direction of travel and calculated from the dimensions of the **cutting means** or the diameter(s) of the **cutting means tip circle(s)**

**2.109****discharge chute**

an extension of the **cutting means enclosure** from the **discharge opening**, generally used to control the discharge of material from the cutting means

**2.110****discharge opening**

a gap or opening in the **cutting means enclosure** through which grass, thatch and moss may be discharged

**2.111****guard**

a part of the appliance or component incorporated to provide protection for the operator and/or bystander

**2.112****handle**

any part likely to be hand-held for guiding the appliance in normal use

**2.113****hit**

the test projectile passing completely through all layers of the target material

**2.114****intended use**

any use of the appliance which is reasonably foreseeable, as described in the user instructions, and which is consistent with such activities as operating, starting, stopping or connecting to (or disconnecting from) a **power source**

**2.115****lawn aerator**

a powered appliance designed for slitting the lawn surface. The appliance uses the ground to determine the height of cut

**2.116**

**lawn scarifier (also known as lawn rake)**

an appliance where the cutting means cuts vertically into the lawn or earthface, or scratches the surface, thereby also combing the lawn. The appliance uses the ground to determine the height of cut

**2.117**

**maximum operating motor speed**

the highest motor speed obtainable when the motor is adjusted in accordance with the manufacturer's specifications and/or instructions, with the cutting means engaged

**2.118**

**operator control**

any **control** requiring the operator's actuation to perform specific functions

**2.119**

**operator presence control**

a **control** designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed

**2.120**

**operator zone**

the operator zone for persons operating a **lawn scarifier** or **aerator** is presented in figure 106

**2.121**

**parking brake**

a device incorporated into the appliance which, when operated, prevents the appliance from moving from a stationary position and remains applied without the operator present

**2.122**

**pedestrian-controlled**

ground-supported, controlled by an operator walking behind

**2.123**

**power source**

a motor which provides mechanical energy for linear or rotational movement

**2.124**

**rotary appliance**

a **scarifier/aerator** in which the **cutting means** rotates about an axis or axes normal to the ground

**2.125**

**service brake**

the designated primary means for decelerating and stopping a machine from its ground travel speed

**2.126**

**thrown object hazard**

the potential for injury caused by object(s) propelled by the moving **cutting means**

**2.127**

**tine(s)**

for the purpose of this standard, a term used in warnings and instructions to denote "**cutting means**" (see 2.104: cutting means)

## 2.128 traction drive

the means (system) used to transmit power from the **power source** to the ground drive means

### 3 General requirement

This clause of part 1 is applicable.

### 4 General conditions for the tests

This clause of part 1 is applicable except as follows:

#### 4.5 Addition:

*During the tests the **cutting means** are adjusted and lubricated in accordance with the manufacturer's instructions specific to the test.*

#### 4.6 Addition:

Electronic speed **control** devices are set for the highest speed.

### 5 Void

### 6 Classification

This clause of part 1 is applicable except as follows:

#### 6.1 Replacement:

Appliances shall be of one of the following classes with respect to protection against electric shock:

- class II or class III.

*Compliance is checked by inspection and by the relevant tests.*

#### 6.2 Addition:

Appliances shall be at least IPX4.

### 7 Marking and instructions

This clause of part 1 is applicable except as follows:

#### 7.1 Addition:

The substance of the following warning shall be placed in a prominent position on the appliance. The letters, which may be in upper or lower case, shall be a minimum of 3 mm high, in black on a yellow background. Where appropriate IEC/ISO symbols or pictograms are available, they may be used. Markings or symbols giving cautionary information shall be located close to the hazard.

**WARNING:**

**SWITCH OFF AND REMOVE PLUG FROM MAINS BEFORE ADJUSTING AND CLEANING, OR IF THE CORD IS ENTANGLED OR DAMAGED.**

**READ THE INSTRUCTION SHEET.**

**KEEP THE SUPPLY FLEXIBLE CORD AWAY FROM THE MACHINE. PARTS CONTINUE TO ROTATE AFTER THE MACHINE IS SWITCHED OFF.**

For rotary **lawn scarifiers/aerators**, if applicable, an instruction that the appliance shall not be operated without either the entire **catcher or guard** in place shall be fixed near the **discharge opening** and the **catcher** adaptor, if one is used.

**7.6 Addition:**

NOTE 101 Information on operator symbols may be found in ISO 3767-1 and ISO 3767-3, and in ISO 3864 for colours.

**7.9 Modification:**

*Replace the first paragraph by the following:*

**Operator controls** as described in 20.101.1, other than those whose purpose is obvious, shall have the function, direction and/or method of operation clearly identified by a durable label or mark.

**7.12 Replacement:**

An instruction sheet shall be supplied with the appliance.

The instructions shall include the following:

- a) Those warnings required to be marked on the appliance together with further explanation, where appropriate.
- b) Instructions for the proper assembly of the appliance for use, if the appliance is not supplied in a completely assembled form.
- c) For rear delivery appliances with exposed rear rollers when used without a **catcher**, full eye protection shall be worn.
- d) Instructions for proper adjustment of the appliance, including a warning of the danger of rotating parts, for example, "Caution – Do not touch rotating parts".
- e) Instructions for the safe operation of the appliance, including a recommendation that the appliance should be supplied via a residual current device (RCD) with a tripping current of not more than 30 mA.
- f) Instructions on the operation of all **controls**.
- g) Advice on the use and type of extension cords to be used (not lighter than required in 25.7).
- h) Instructions for fitting and use of attachments, if any.
- i) The following information shall be given:
  - 1) the continuous A-weighted equivalent sound pressure level at the operator's ear if over 70 dB(A), or a statement to the effect that it does not exceed 70 dB(A);
  - 2) the peak C-weighted instantaneous sound pressure level if over 63 Pa (130 dB in relation to 20 µPa);

- 3) the sound power level emitted by the tool where the equivalent continuous sound pressure level exceeds 85 dB(A);
  - 4) the weighted root mean square acceleration value if it exceeds 2,5 m/s<sup>2</sup>;
  - 5) a statement to the effect if the weighted r.m.s acceleration value does not exceed 2,5 m/s<sup>2</sup>.
- j) The substance of the following, where appropriate:
- 1) *Training*
    - Read the instructions carefully. Be familiar with the **controls** and the proper use of the appliance.
    - Never allow children to use the appliance.
    - Never allow people unfamiliar with these instructions to use the appliance. Local regulations may restrict the age of the operator.
    - Never operate the appliance while people, especially children, or pets are nearby.
    - The operator or user is responsible for accidents or hazards occurring to other people or their property.
  - 2) *Preparation*
    - While operating the appliance, always wear substantial footwear and long trousers.
    - Do not operate the appliance when barefoot or wearing open sandals.
    - Thoroughly inspect the area where the appliance is to be used and remove all stones, sticks, wires, bones, and other foreign objects.
    - Before using, always visually inspect to see that the rotating parts and cutter assembly are not worn or damaged. Replace worn or damaged parts in sets to preserve balance.
  - 3) *Operation*
    - Operate the appliance only in daylight or in good artificial light.
    - Avoid operating the appliance in wet grass, where feasible.
    - Always be sure of your footing on slopes.
    - Walk, never run.
    - Always work across the face of slopes, never up and down.
    - Exercise extreme caution when changing direction on slopes.
    - Do not operate the appliance on excessively steep slopes.
    - Use extreme caution when reversing or pulling the appliance towards you.
    - Stop the rotating parts if the appliance has to be tilted for transportation. Do not operate the **cutting means** when crossing surfaces other than grass, and when transporting the appliance to and from the working area.
    - Never operate the appliance with defective **guards** or shields, or without safety devices, for example deflectors and/or **catchers** in place.
    - Switch on the motor according to instructions and with feet well away from rotating parts.
    - Do not tilt appliance when switching on the motor, except if the appliance has to be tilted for starting. In this case, do not tilt it more than absolutely necessary and lift only the part which is away from the operator. Always ensure that both hands are in the operating position before returning the appliance to the ground.
    - Do not put hands or feet near or under rotating parts.
    - For **rotary appliances** keep clear of the **discharge opening** at all times.

- Never pick up or carry an appliance while the motor is running.
- Pull the plug from the socket:
  - whenever you leave the machine;
  - before clearing a blockage;
  - before checking, cleaning or working on the appliance;
  - after striking a foreign object. Inspect the appliance for damage and make repairs as necessary;
  - if the appliance starts to vibrate abnormally, check immediately.

4) *Maintenance and storage*

- Keep all nuts, bolts and screws tight to be sure the appliance is in safe working condition.
- Check the **catcher** frequently for wear or deterioration.
- Replace worn or damaged parts for safety.

## 8 Protection against access to live parts

This clause of part 1 is applicable except as follows:

### 8.2 Addition:

For **class II rotary appliances** access to the surface of **basic insulation** or metal parts separated from **live parts** by **basic insulation** shall be permitted when the **cutting means** is removed if a **tool** is required for its removal.

## 9 Starting a motor-operated appliance

9.1 Motors shall start under all normal voltage conditions which may occur in use.

Centrifugal and other automatic starting switches shall operate reliably and without contact chattering.

*Compliance is checked by starting the appliance three times, at no-load, at a voltage equal to 0,85 times **rated voltage** or the lower limit of the **rated voltage range**, with any **control device** set at maximum speed.*

*For the test the **cutting means** are adjusted according to the manufacturer's instructions related to this test.*

*The appliance shall operate in such a way that safety is not affected.*

## 10 Power input and current

This clause of part 1 is applicable except as follows:

10.1 Not applicable.