



# SLOVENSKI STANDARD

## SIST EN 60335-2-77:2010

01-december-2010

Nadomešča:

SIST EN 50338:2006

SIST EN 60335-2-77:2006

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**Varnost gospodinjskih in podobnih električnih aparatov - 2-77. del: Posebne zahteve za ročno vodene električne vrtno kosilnice (IEC 60335-2-77:2002, spremenjen)**

Safety of household and similar appliances - Part 2-77: Particular requirements for pedestrian-controlled walk-behind electrically powered lawn mowers (IEC 60335-2-77:2002, modified)

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Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-77: Besondere Anforderungen für handgeführte elektrisch betriebene Rasenmäher (IEC 60335-2-77:2002, modifiziert)

Appareils électrodomestiques et analogues - Sécurité - Partie 2-77: Règles particulières pour les tondeuses à gazon fonctionnant sur le réseau et à conducteur à pied (CEI 60335-2-77:2002, modifiée)

**Ta slovenski standard je istoveten z: EN 60335-2-77:2010**

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**ICS:**

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EUROPEAN STANDARD  
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EUROPÄISCHE NORM

**EN 60335-2-77**

September 2010

ICS 65.060.70

Supersedes EN 50338:2006, EN 60335-2-77:2006

English version

**Safety of household and similar appliances -  
Part 2-77: Particular requirements for pedestrian-controlled walk-behind  
electrically powered lawn mowers  
(IEC 60335-2-77:2002, modified)**

Appareils électrodomestiques  
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This European Standard was approved by CENELEC on 2010-09-01. 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.

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**CENELEC**

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of the International Standard IEC 60335-2-77:2002, prepared by SC 61F, Safety of hand-held motor-operated electric tools, of IEC TC 61, Safety of household and similar electrical appliances, together with the common modifications prepared by the Technical Committee CENELEC TC 61F, Safety of hand-held and transportable motor-operated electric tools, was submitted to the CENELEC formal vote and was approved as EN 60335-2-77 on 2010-09-01.

This document supersedes EN 50338:2006 and EN 60335-2-77:2006.

The text of EN 60335-2-77:2006 has been revised by CLC/TC 116/WG 5, Garden appliances, to add the mechanical requirements and bring this standard in line with the Machinery Directive 2006/42/EC. Additionally the safety requirements for battery powered lawnmowers have been included to replace EN 50338:2006; therefore the title is renamed.

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

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) 2011-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-09-01

This Part 2-77 is to be used in conjunction with EN 60335-1. This Part 2-77 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard: Particular requirements for pedestrian-controlled walk-behind electrically powered lawn mowers.

When a particular subclause of Part 1 is not mentioned in this Part 2-77, that subclause applies as far as is reasonable. When this standard states “addition”, “modification” or “replacement”, the relevant text of Part 1 is to be adapted accordingly.

This European Standard has been prepared under Mandate M/396 given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EU Directive 2006/42/EC. See Annex ZZ.

There are no special national conditions causing a deviation from this European Standard, other than those listed in Annex ZA to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in Annex ZB to EN 60335-1.

Other harmonised standards referred to in this European Standard are listed in Annex ZC of Part 1 and this Part 2. The annex lists the valid edition of those documents at the time of issue of this EN. All references are however to be understood as references to the latest edition.

The following numbering system is used:

- subclauses that are numbered starting from 101 are additional to those in Part 1;
- additional annexes are lettered AA, BB, etc.;

NOTE In this European Standard the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matter: in smaller roman type.

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## Contents

Introduction .....	7
1 Scope .....	8
2 Normative references .....	8
3 Definitions .....	10
4 General requirement .....	13
5 General conditions for the tests .....	13
6 Classification .....	13
7 Marking and instructions .....	13
8 Protection against access to live parts .....	16
9 Starting of motor-operated appliances .....	16
10 Power input and current .....	16
11 Heating .....	17
12 Void .....	17
13 Leakage current and electric strength at operating temperature .....	17
14 Transient overvoltages .....	17
15 Moisture resistance .....	17
16 Leakage current and electric strength .....	17
17 Overload protection of transformers and associated circuits .....	17
18 Endurance .....	17
19 Abnormal operation .....	18
20 Stability and mechanical hazards .....	18
21 Mechanical strength .....	39
22 Construction .....	46
23 Internal wiring .....	48
24 Components .....	48
25 Supply connection and external flexible cords .....	49
26 Terminals for external conductors .....	49
27 Provision for earthing .....	49
28 Screws and connections .....	50
29 Clearances, creepage distances and solid insulation .....	50
30 Resistance to heat and fire .....	50
31 Resistance to rusting .....	50
32 Radiation, toxicity and similar hazards .....	50

STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN 60335-2-77:2010](https://standards.iteh.ai/catalog/standards/sist/13d44b16-ca6b-439f-b4db-01abd5f15225/sist-en-60335-2-77-2010)

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<b>Annexes</b> .....	51
Annex B (normative) Appliances powered by rechargeable batteries .....	51
Annex AA (normative) Safety signs and symbols .....	52
Annex BB (normative) Test enclosure target panels – Corrugated fibreboard penetration test (see 20.107.3.3.2) .....	55
Annex CC (normative) Target panel elevation areas and suggested data sheet for thrown object test (see 20.107.3.3) .....	57
Annex DD (normative) Test enclosure (see 20.107.4.1).....	59
Annex EE (informative) Safety instructions for lawnmowers.....	63
Annex FF (normative) Vibration .....	66
Annex GG (normative) Noise test code – Engineering method (grade 2) .....	71
Annex HH (informative) Example of a material and construction fulfilling the requirements for an artificial surface .....	77
Annex ZZ (informative) Coverage of Essential Requirements of EC Directives .....	79
Bibliography .....	80
 <b>Figures</b>	
Figure 1 – Operator zone – Pedestrian controlled lawn mower (see 20.103).....	20
Figure 2 – Foot probe test (see 20.101).....	21
Figure 3 – Handle distance (see 20.107.6.1) and rear cutting means enclosure (see 20.107.1.1) .....	25
Figure 4 – Front opening restrictions for single spindle lawnmowers (see 20.107.1.1.2).....	26
Figure 5 – Front opening restrictions for multi-spindle lawnmowers (see 20.107.1.1.2) .....	26
Figure 6 – Construction for front opening (see 20.107.1.1.2).....	27
Figure 7 – Example of test cycle (see 20.107.2.1).....	29
Figure 8 – Thrown object test fixture – General layout (see 20.107.3.3 and 20.107.4.1.3).....	31
Figure 9 – Single spindle lawnmower – Test enclosure (see 20.107.4) .....	33
Figure 10 – Multi-spindle lawnmower – Test enclosure (see 20.107.4).....	34
Figure 11 – Test of cutting cylinder guarding (see 20.108.1.1).....	36
Figure 12 – Side coverage of cutting cylinders (see 20.108.1.2).....	37
Figure 13 – Top coverage of cutting cylinders (see 20.108.1.3).....	37
Figure 14 – Rear coverage of cutting cylinders (see 20.108.1.4) .....	38
Figure 15 – Cylinder mower – Throw line (see 20.108.2) .....	39
Figure 16 – Example of suitable impact test fixture (see 20.101.2.1).....	41
Figure 17 – Structural integrity tests (see 21.101.4.1.1) .....	45
Figure 18 – Impact test fixture for handle insulation .....	47
Figure AA.1 – Pictogram illustrating “Read operator’s manual” .....	52
Figure AA.2 – Pictogram illustrating “Keep bystanders away” .....	52
Figure AA.3 – Pictogram illustrating “Beware of sharp blades. Blades continue to rotate after the motor is switched off – remove plug from mains before maintenance or if cord is damaged.” for mains operated machines .....	53
Figure AA.4 – Pictogram illustrating “Beware of sharp blades. Blades continue to rotate after the motor is switched off – Remove disabling device before maintenance” for battery operated machines .....	53
Figure AA.5 – Pictogram illustrating “Keep supply flexible cord away from cutting means” for mains operated machines .....	54

Figure BB.1 – Test fixture for corrugated fibreboard penetration test.....	56
Figure CC.1 – Example of data sheet for thrown object test.....	58
Figure DD.1 – Nail plan of test enclosure base.....	60
Figure DD.2 – Object test enclosure – Base detail .....	61
Figure DD.3 – Test enclosure walls and base.....	62
Figure FF.1 – Examples of transducer location/orientation (pedestrian controlled machines).....	68
Figure FF.2 – Examples of transducer location/orientation for hand-arm vibration .....	69
Figure GG.1 – Microphone positions on the hemisphere (see Table GG.1).....	72
Figure HH.1 – Sketch of the measurement surface covered with an artificial surface (not to scale)....	78

### Tables

Table 1 – Sizing of test fixture air inlet holes.....	43
Table GG.1 – Co-ordinates of microphone positions .....	73
Table GG.2 – Absorption coefficients.....	74

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[SIST EN 60335-2-77:2010](https://standards.iteh.ai/catalog/standards/sist/13d44bf6-ca6b-439f-b4db-01abd5f15225/sist-en-60335-2-77-2010)

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## Introduction

This document is a C type standard as stated in EN ISO 12100-1.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered is as indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the other standards, for machines which have been built and designed to the provisions of this type C standard.

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## 1 Scope

This clause of Part 1 is replaced by the following.

This European Standard specifies safety requirements and their verification for the design and construction of pedestrian controlled walk-behind electrically powered lawnmowers. This standard applies in conjunction with EN 60335-1.

This European Standard does not apply to

- lawn trimmers, lawn edge trimmers, lawn edgers, flail mowers, scrub cutters, automatic (robot) lawn mowers, sickle-bar mowers, agricultural mowers, trailing seat/sulky units, ride-on machines or non-powered lawnmowers
- rotary lawnmowers for which the cutting means is a generally circular central drive unit on which is mounted, either one or more non-metallic filaments or one or more non-metallic, pivotally mounted cutting elements. These cutting elements rely on centrifugal force to achieve cutting, with the kinetic energy of a single cutting element not exceeding 10 J,
- battery powered lawnmowers with a rated voltage of the battery more than 42 V d.c.

Requirements for battery chargers, including those incorporated into the machine are dealt with in EN 60335-2-29.

This European Standard is not applicable to lawnmowers, which are manufactured before the date of publication of this document by CENELEC.

NOTE Combustion engine driven machines are covered by EN 836.

## 2 Normative references

This clause of Part 1 is applicable except as follows.

### Addition:

EN 60320-2-3, Appliance couplers for household and similar general purposes – Part 2-3: Appliance couplers with a degree of protection higher than IPX0 (IEC 60320-2-3)

EN 60335-1, Household and similar electrical appliances – Safety – Part 1: General requirements (IEC 60335-1, mod.)

EN 60335-2-29, Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers (IEC 60335-2-29)

EN ISO 354:1993 <sup>1)</sup>, Acoustics – Measurement of sound absorption in a reverberation room (ISO 354:1985)

EN ISO 3744:1995, Acoustics – Determination of sound power levels of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)

EN ISO 3767-1:1995 <sup>2)</sup>, Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 1: Common symbols (ISO 3767-1:1991)

1) Superseded by EN ISO 354:2003, *Acoustics - Measurement of sound absorption in a reverberation room* (ISO 354:2003).

2) Superseded by EN ISO 3767-1:2000, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays - Part 1: Common symbols* (ISO 3767-1:1998), withdrawn.

EN ISO 3767-2:1995 <sup>3)</sup>, Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 2: Symbols for agricultural tractors and machinery (ISO 3767-2:1991)

EN ISO 3767-3 <sup>3)</sup>, Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays – Part 3: Symbols for powered lawn and garden equipment (ISO 3767-3)

EN ISO 11201:1995, Acoustics – Noise emitted by machinery and equipment – Measurement of emission sound pressure levels at a work station and at other specified positions – Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995)

EN ISO 11688-1:1998, Acoustics – Recommended practice for the design of low-noise machinery and equipment – Part 1: Planning (ISO/TR 11688-1:1995)

EN ISO 12100-1:2003, Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)

EN ISO 12100-2:2003, Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)

EN ISO 13857:2008, Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)

EN ISO 20643:2005, Mechanical vibration – Hand-held and hand-guided machinery – Principles for evaluation of vibration emission (ISO 20643:2005)

ISO 500:1991 <sup>4)</sup>, Agricultural tractors – Rear-mounted power take-off – Types 1, 2 and 3

ISO 2758:1983 <sup>5)</sup>, Paper – Determination of bursting strength

ISO 3304:1985, Plain end seamless precision steel tubes – Technical conditions for delivery

ISO 3305:1985, Plain end welded precision steel tubes – Technical conditions for delivery

ISO 3306:1985, Plain end as-welded and sized precision steel tubes – Technical conditions for delivery

ISO 4046:1978 <sup>6)</sup>, Paper, board, pulp and related terms – Vocabulary

ISO 4200:1991, Plain end steel tubes, welded and seamless – General tables of dimensions and masses per unit length

ISO 11684, Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Safety signs and hazard pictorials – General principles

EN ISO 3767-5, Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays - Part 5: Symbols for manual portable forestry machinery

ISO 3864, Graphical symbols – Safety colours and safety signs

ISO 7000, Graphical symbols for use on equipment – Index and synopsis

ISO 7010, Graphical symbols – Safety colours and safety signs – Safety signs used in workplaces and public areas

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3) Withdrawn.

4) Superseded by ISO 500:2004 series, *Agricultural tractors – Rear-mounted power take-off types 1, 2 and 3*.

5) Superseded by EN ISO 2758:2003, *Paper – Determination of bursting strength* (ISO 2758:2001).

6) Superseded by ISO 4046:2002 series, *Paper, board, pulp and related terms – Vocabulary*.

### 3 Definitions

This clause of Part 1 is applicable except as follows.

#### 3.1.9 *Replacement:*

#### 3.1.9

##### **normal operation**

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

##### **Addition:**

#### 3.101

##### **cutting means tip circle**

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

#### 3.102

##### **braking distance**

distance travelled between the point of the first application of the brake control and the point at which the machine comes to rest

#### 3.103

##### **braking system**

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

#### 3.104

##### **cutting means; blade**

mechanism used to provide the cutting action

#### 3.105

##### **cutting means enclosure**

part or assembly which provides the protective means around the cutting means

#### 3.106

##### **cutting positions**

any height setting of the cutting means designated by the manufacturer for cutting grass

#### 3.107

##### **cutting width**

total width of cut measured across the cutting means at right angles to the direction of travel

#### 3.108

##### **cylinder lawnmower**

powered lawnmower with one or more cutting means rotating about a horizontal axis to provide a shearing action with a fixed cutter bar or cutting means

#### 3.109

##### **discharge chute**

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

#### 3.110

##### **discharge opening**

gap or opening in the cutting means enclosure through which grass can be discharged

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**3.111****flail mower**

grass-cutting machine with a multiplicity of free-swinging cutting elements that rotate about an axis parallel to the cutting plane and cut by impact

**3.112****grass catcher**

part or combination of parts which provides a means for collecting grass clippings or debris

**3.113****hover lawnmower**

powered lawnmower which uses a cushion of air as its ground support

**3.114****lawn edger**

powered machine suitable for cutting lawn and soil, usually in a vertical plane

**3.115****lawn edge trimmer**

grass trimming machine where the cutting means operates in a plane approximately perpendicular to the ground

**3.116****lawn trimmer**

grass trimming machine where the cutting means operates in a plane approximately parallel to the ground

**3.117****maximum operating motor speed**

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

**3.118****mowing attachment**

cutting means designed to be easily detached from the machine, generally to allow the machine to be used for other purposes

**3.119****mulching lawnmower**

rotary lawnmower without discharge openings in the cutting means enclosure

**3.120****normal use**

normal operation, plus routine maintenance, servicing, cleaning, transporting, attaching or removing accessories, and making ordinary adjustments as determined by the manufacturer's instructions

**3.121****open discharge chute**

discharge chute without a self closing guard or with a self closing guard which does not completely close the chute

**3.122****operator control**

any control requiring operator actuation to perform specific functions

**3.123****operator presence control**

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

**3.124****pedestrian-controlled powered lawnmower**

grass-cutting machine, either pushed or self-propelled, normally controlled by the operator walking behind the unit

**3.125****powered lawnmower**

grass-cutting machine or a machine with grass-cutting attachment(s) which uses the ground to determine the height of cut by means of wheels, air cushion or skids, etc., and which utilizes an electric motor for a power source

**3.126****ride-on (riding) machine; lawn and garden tractor**

self-propelled machine on which an operator rides and which is designed primarily for cutting grass and auxiliary garden work

NOTE The **cutting means** can be an integral part of the machine or suspended from or attached to the machine.

**3.127****rotary lawnmower**

powered lawnmower in which one or more cutting means, cutting by impact, rotate about an axis normal to the cutting plane

**3.128****service brake system**

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

**3.129****sickle bar mower**

mower which uses an electric power source to reciprocate a knife or knives to provide a shearing action with a stationary cutter bar or movable knife

**3.130****trailing seat/sulky unit**

removable, trailing device designed to carry a standing or seated operator to ride behind while controlling a self-propelled, pedestrian-controlled lawnmower or tractor

NOTE Also known as a "sulky".

**3.131****automatic (robot) mower**

automatic lawnmower that operates without human control. It operates only within a delimited perimeter or within a pre-programmed area

**3.132****cutter unit**

combination of cutting means and cutting means enclosure

**3.133****disabling device**

part which is removable from the lawnmower, such as for example a key, which prevents operation of the lawnmower when it is removed

**3.134****removable battery**

battery that is removable without tools

**4 General requirement**

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:**

A new machine shall be used for each of the tests of Clause 21.

**5.5 Addition:**

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

NOTE For example, cylinder mower cutting means may not be able to run for extended periods at normal adjustment because of lack of lubrication etc. normally provided by the grass.

**5.6 Addition:**

Electronic speed control devices are set for the highest speed.

**5.8.1 Replacement:**

Unless otherwise specified, a fully charged battery shall be used for each test. Where for consecutive tests the same battery is specified there shall be a minimum of 1 min rest time between tests.

**6 Classification**

This clause of Part 1 is applicable except as follows.

**6.1 Replacement:**

Mains operated machines shall be of one of the following classes with respect to protection against electric shock:

- class II or class III.

Battery powered machines incorporating battery chargers shall be class II. Other battery-powered machines shall be class III.

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

**6.2 Addition:**

Class II machines shall be at least IPX4. Class III machines shall be at least IPX1.

**7 Marking and instructions**

This clause of Part 1 is applicable except as follows.