SLOVENSKI STANDARD
SIST EN 786:1996/A1:2001

01-december-2001

Oprema za nego vrta - Električno gnane, ročno vodljive in prenosne motorne kose za trate in robove trat - Mehanska varnost

Garden equipment - Electrically powered walk-behind and hand-held lawn trimmers and lawn edge trimmers - Mechanical safety

Gartengeräte - Elektrisch betriebene handgeführte und handgehaltene Rasentrimmer und Rasenkantentrimmer - Mechanische Sicherheit

Matériel de jardinage - Coupe-gazon et coupe-bordures électriques portatifs et a conducteur a pied - Sécurité mécanique

Ta slovenski standard je istoveten z: **EN 786:1996/A1:2001**

ICS:

65.060.70	Vrtnarska oprema	Horticultural equipment

SIST EN 786:1996/A1:2001 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 786:1996/A1

March 2001

ICS 65.060.70

English version

Garden equipment - Electrically powered walk-behind and hand-held lawn trimmers and lawn edge trimmers - Mechanical safety

Matériel de jardinage - Coupe-gazon et coupe-bordures électriques portatifs et à conducteur à pied - Sécurité mécanique

Gartengeräte - Elektrisch betriebene handgeführte und handgehaltene Rasentrimmer und Rasenkantentrimmer - Mechanische Sicherheit

This amendment A1 modifies the European Standard EN 786:1996; it was approved by CEN on 4 February 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This Amendment EN 786:1996/A1:2001 to EN 786:1996 has been prepared by Technical Committee CEN/TC 144 "Tractors and machinery for agriculture and forestry", the secretariat of which is held by AFNOR

This Amendment to the European Standard EN 786:1996 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2001, and conflicting national standards shall be withdrawn at the latest by September 2001.

This Amendment to the European Standard EN 786:1996 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

This amendment which specifically deals with the garding of cutting means, vibration and noise, replaces :

— the previous Figures 2 and 3 ; and

— the "Not yet dealt with" notes in the right hand column of Table A.1 against hazard items 4.1, 4.2 and 5 listed in the left hand column.

Annexes D and E are normative. Annex F is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

2 Normative references

Add the following references:

EN 292-2:1991/A1:1995, *Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles and specifications.*

EN 836:1997, *Garden equipment - Powered lawnmowers – Safety*.

EN 28662-1:1992, *Hand-held portable power tools - Measurement of vibrations at the handle – Part 1: General (ISO 8662-1:1988).*

EN ISO 354:1993, *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 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).*

4 Safety requirements and/or measures

4.6 Guarding of cutting means

Replace the Figures 2 and 3 by the following:

Dimensions in millimetres

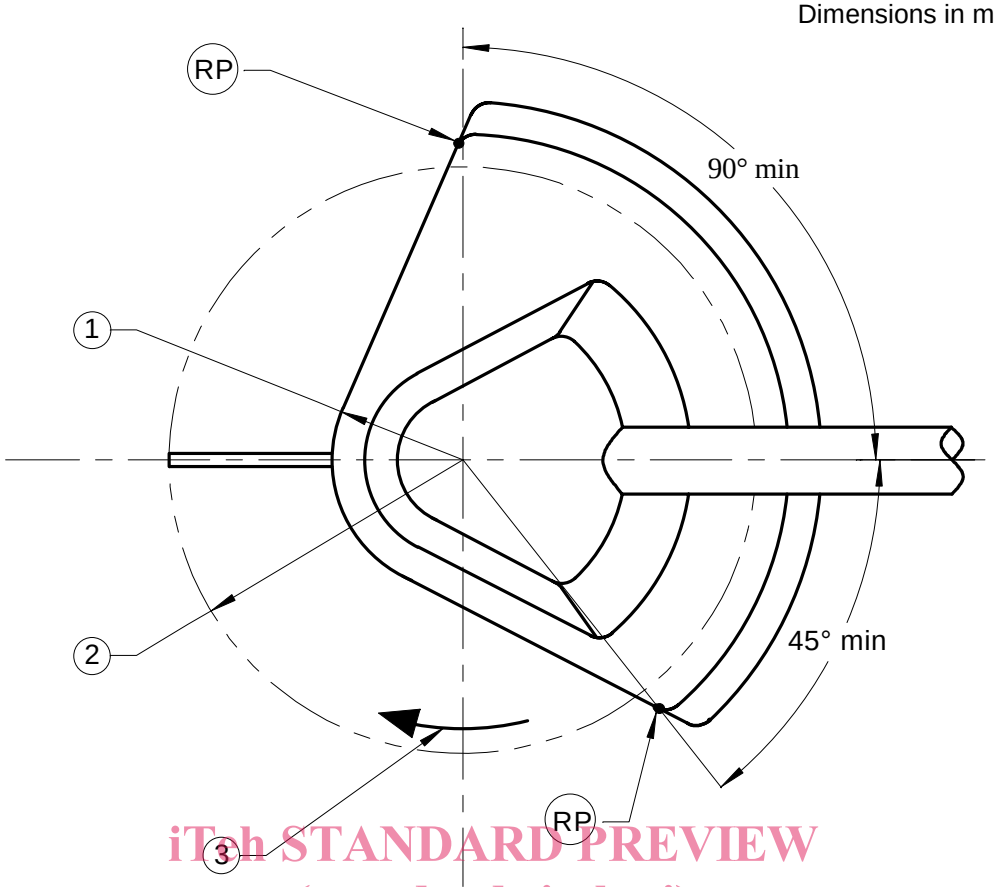

Figure 2a - Plan view

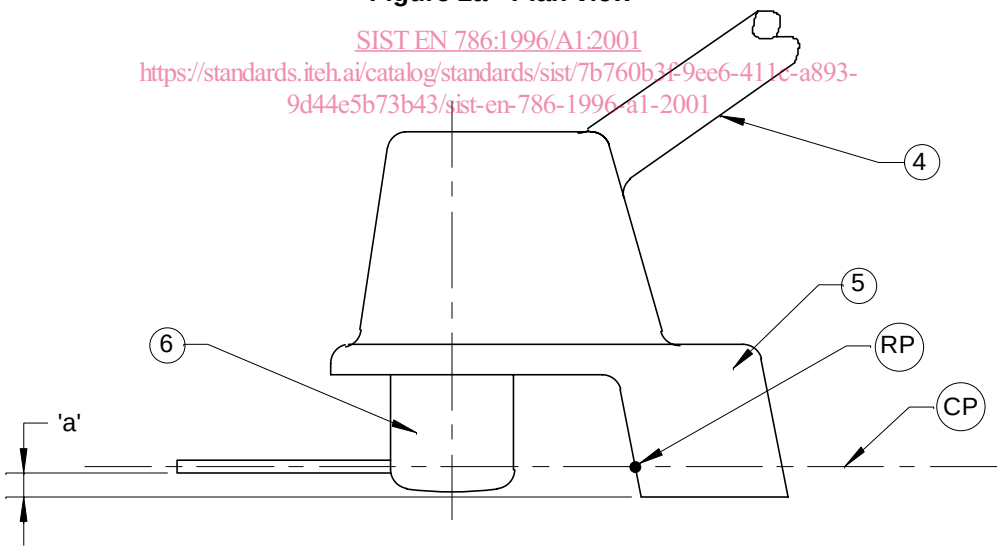

Figure 2b - Side view

KEY

1 Radius 'X'
2 Maximum radius of cutting element
3 Direction of rotation
a = 3 min for walk-behind machines
4 Handle shaft
5 Guard
6 Cutting head
a = 10 min for hand-held machines

NOTE 1 For reasons of clarity, any skids or wheels are not shown in the figures. The figures are not intended to govern design except as regards the dimensions and specific requirements shown
NOTE 2 Figures are not to scale
NOTE 3 If the direction of rotation is reversed the 45^{o} and 90^{o} guarding requirements are reversed
NOTE 4 The reference point 'RP' is where the centre-plane of the cutting element 'CP' intersects the outer edge of the guard

Figure 2 — Guard, lawn trimmer (see 4.6.2)

Dimensions in millimetres

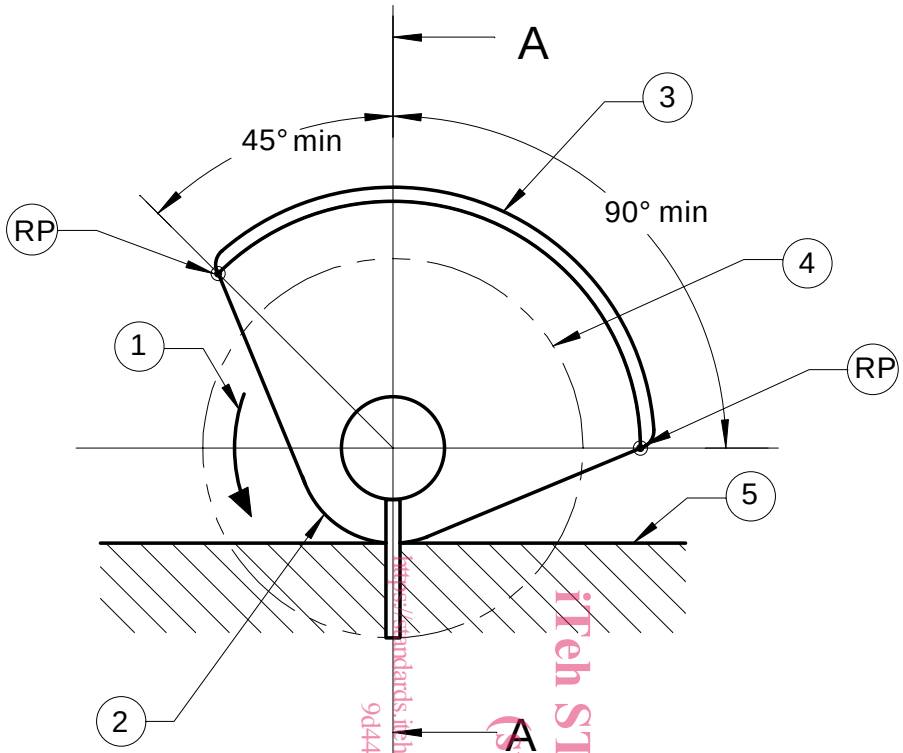

Figure 3a — View towards cutting means

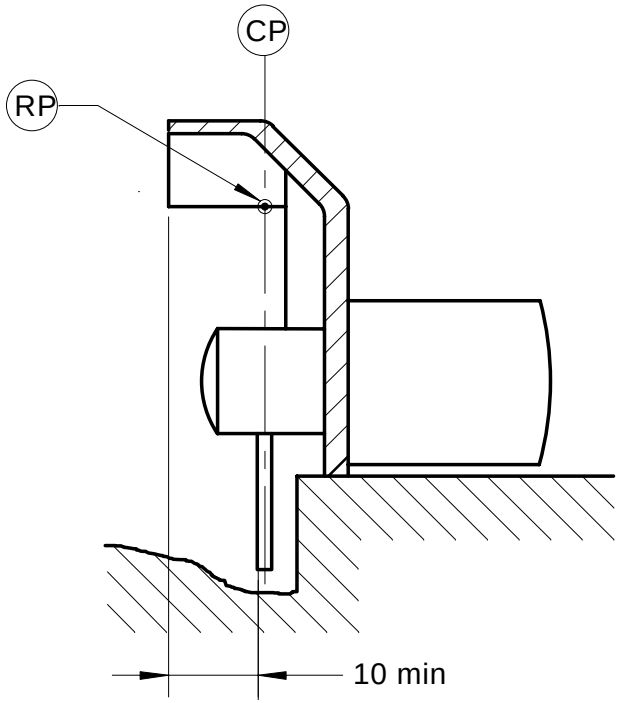

Figure 3 b — Part section at AA (guard only)

KEY

1 Direction of rotation
2 Radius "Y"
3 Guard
4 Maximum radius of cutting element
5 Plane of lawn edge

NOTE 1 For reasons of simplification the handle and any skids or wheels are not shown in the figures. The figures are not intended to govern the design except as regards the dimensions and the specific requirements shown

NOTE 2 Figures are not to scale

NOTE 3 If the direction of rotation is reversed the 45° and 90° guarding requirements are transposed

NOTE 4 The reference point 'RP' is where the centre plane of the cutting element 'CP' intersects the outer guard edge

Figure 3 — Guard, lawn edge trimmer (see 4.6.3)

Add the following sub-clauses 4.8 and 4.9:

4.8 Vibration

The requirements of 4.8 apply to hand-held lawn trimmers and hand-held lawn edge trimmers. The methods for vibration measurements given in EN 836:1997 are valid for walk-behind lawn trimmers and walk-behind lawn edge trimmers.

4.8.1 Reduction by design and protective measures

The machine shall be designed to generate a vibration level as low as practicable. The main sources causing vibration are the :

— oscillating forces from the motor ;

— cutting means ;

— unbalanced moving parts ;

— impact in gears, bearings and other mechanisms ;

— interaction between operator, machine and material being worked.

NOTE 1 CR 1030-1:1995 gives general technical information on widely recognised technical rules and means to be followed in the design of machines for low hand-arm vibration solutions.

NOTE 2 Besides the vibration reduction of the source, technical measures to isolate the vibration source from the handle may be used, when appropriate, such as isolators and resonating masses.

4.8.2 Reduction by information

After taking possible technical measures for vibration reduction, it is still recommended that, when appropriate, the instruction handbook recommends :

— the use of low-vibration operating modes, and/or limited time of operation ;

— the wearing of personal protection equipment (PPE).

4.8.3 Vibration measurement

For the measurement of hand-arm vibration the methods given in Annex D shall be used.

4.9 Noise

The requirements of 4.9 apply to hand-held lawn trimmers and hand-held lawn edge trimmers. The methods for noise measurements given in EN 836:1997 are valid for walk-behind lawn trimmers and walk-behind lawn edge trimmers.

4.9.1 Reduction as a safety requirement

4.9.1.1 Reduction at source by design and protective measures

The machine shall generate a noise level as low as practicable. The main sources causing noise are:

— air intake system ;

— engine cooling system ;

— cutting system ;

— vibrating surfaces.

EN ISO 11688-1:1998 gives general technical information on widely recognised technical rules and means to be followed in the design of low-noise machines.

4.9.1.2 Reduction by information

If after taking all possible technical measures for reducing noise at the design stage a manufacturer considers that further protection of the operator is necessary, then the instruction handbook shall:

— recommend the use of low-noise operating modes, and/or limited time of operation ;

— give a warning of the noise level and recommend the use of ear protection.

4.9.2 Noise emission measurement

The determination of the sound power level and of the emission sound pressure level at the operator's position shall be carried out using the measurement methods given in Annex E.

5 Information for use

5.1 Instruction handbook

5.1.1 General

Insert the following paragraph:

The instruction handbook and the technical documentation describing the machine shall :

— give the declared noise emission values of the machinery in accordance with 1.7.4 f) of Annex A of EN 292-2:1991/A1:1995;

— give reference to the noise test code specified in Annex E;

— give the declared vibration values of the machinery in accordance with 3.6.3 of Annex A of EN 292-2:1991/A1:1995;

— give reference to the vibration test code specified in Annex D.

Annex A

Amend Table A.1, rows 4.1, 4.2 and 5 as follows:

Hazards		Relevant clauses (informative)		Solutions given by this standard
		EN 292-1	EN 292-2	
4.1	hearing losses (deafness), other physiological disorders (eg. loss of balance, loss of awareness)	4.5	Annex A, 1.5.8, 1.7.4 f)	Dealt with in 4.9, 5.1
4.2	interferences with speech communication, acoustic signals, etc.	4.5	Annex A, 1.5.8, 1.7.4 f)	Dealt with in 4.9, 5.1
5	Hazards generated by vibration (resulting in a variety of neurological and vascular disorders)	4.6	Annex A, 1.5.9, 3.6.3	Dealt with in 4.8, 5.1

Add the following Annexes D and E (normative) and Annex F (informative):

Annex D
(normative)

Vibration

D.1 Quantities to be measured

The values measured shall be:

— acceleration according to 3.1 of EN 28662-1:1992, presented as weighted acceleration $a_{h,W}$ according to 3.3 of EN 28662-1:1992 ;

— rotational speed of the engine.

D.2 Instrumentation

D.2.1 General

For specification of instrumentation see 4.1 of EN 28662-1:1992.

D.2.2 Transducer

For specifications of transducer see 4.1 of EN 28662-1:1992.

D.2.3 Fastening of transducer

Fastening of transducer shall be in accordance with 4.2 of EN 28662-1:1992.

D.2.4 Calibration

Calibration shall be made in accordance with 4.8 of EN 28662-1:1992.

D.3 Measurement direction and measurement location

D.3.1 Measurement direction

Measurements shall be made on each handle for the 3 directions x, y and z (see Figure D.1).

D.3.2 Measurement location

Typical locations of the transducer assemblies and directions of measurement are shown in Figure D.1.

D.4 Test procedure

D.4.1 Determination of working procedure

Tests shall be carried out on a new, normal production machine featuring standard equipment with the machine provided by the manufacturer.

The machine shall be run until stable conditions are reached before the test is commenced. Filament line(s), if any, shall be at the correct operating length. All speed setting devices shall be adjusted to the highest figure.

The rated voltage or the upper limit of the rated voltage range and/or frequency shall be maintained during the test at 0,98 to 1,02 times the stated values. The supply voltage of mains powered machines is measured at the plug of the cable or cord supplied, not at the plug of any extension cable or cord. Battery powered machines shall be powered by an external power source maintained at the nominal voltage of the battery.

During the test the cutting means shall be driven. Contact between the hand and the transducer shall be avoided.