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**Oprema za nego vrta - Vrtni pihalniki, vrtni sesalniki in vrtni
pihalniki/sesalniki - Varnost**

Garden equipment - Garden blowers, vacuums and blower/vacuums - Safety

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Foreword

This document (prEN 15503:2006) 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 document is currently submitted to the CEN Enquiry.

This document 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 document.

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Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

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

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 provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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1 Scope

This European Standard specifies the safety requirements and their verification for the design and construction of hand-held integrally powered and back-pack powered, garden vacuums and garden blower/vacuums with or without shredding means and garden blowers. In addition, it specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

This European Standard deals with all the significant hazards, hazardous situations and events relevant to these machines (except structural integrity) when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4). The safety requirements of electrical blowers and blower vacuums are covered by EN 60335-1.

This European Standard is applicable only to machines which are to be used by one operator only.

It does not in general take into account:

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

This European Standard is not applicable to:

- pedestrian controlled machines;
- ride-on machines;
- vacuum cleaners intended primarily for use indoors, for water suction cleaning or animal grooming.

EMC and environmental hazards other than noise have not been considered in this European Standard. This European Standard is not applicable to machines which are manufactured before the date of its publication as EN.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 294: 1992, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

EN 954-1:1996, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design*

prEN 14930:2005, *Agricultural and forestry machinery and gardening equipment - Determination of inadvertent accessibility of hot surfaces*

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 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) ISO 3767-1, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 3767-3, *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 3767-4, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 4: Symbols for forestry machinery*

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 3864-1:2002, *Graphical symbols - Safety colours and safety signs – Part 1: Design principles for safety signs in work places and public areas*

ISO 11684:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety signs and hazard pictorials — General principles*

ISO 22867, *Forestry machinery -- Vibration test code for portable hand-held machines with internal combustion engine - - Vibration at the handles*

ISO 22868, *Forestry machines — Noise test code for portable hand-held machines with an internal combustion engine — Engineering method (grade 2 of accuracy)*

IEC 61032:1997, *Protection of persons and equipment by enclosures - Probes for verification*

3 Definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply:

3.1

back-pack powered blower

garden blower designed to have the power source carried on the operator's back by means of a supporting device

3.2

back-pack powered vacuum

garden vacuum designed to have the power source and collector carried on the operator's back by means of a supporting device

3.3

debris collector

part or combination of parts that provides a means for collecting debris

3.4

dirty fan construction

construction where the debris being collected comes into contact with the air-moving fan

3.5

guard

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

3.6

hand held garden blower

machine supported by hand, possibly assisted by a harness, wheel etc., which blows debris

3.7

hand held garden blower/vacuum

machine supported by hand, possibly assisted by a harness, wheel etc., which may perform as a garden blower, or, as a garden vacuum for picking up debris into a debris collector

3.8

hand held garden vacuum

machine supported by hand, possibly assisted by a harness, wheel etc., which collects debris into a debris collector

3.9

handle

any part intended to be hand-held for holding or supporting the machine in normal operation

3.10

normal operation

any use of the machine which is reasonably foreseeable, and which is consistent with such activities as carrying, operating, starting, stopping or re-fuelling

3.11

machine

throughout this standard the term 'machine' is used to mean all the types of garden blowers and vacuums covered by this standard

3.12

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

3.13

operator control

any control requiring operator actuation to perform specific functions

3.14

shredding means

cutting means for the purpose of reducing organic materials to smaller pieces

3.15

throttle lock

device for temporarily setting the throttle in a partially open position, to aid starting

3.16

throttle setting device

manually activated device to set and fix (or release) the throttle setting in a steady position to facilitate operation of the engine over a longer working period

3.17

tortuous path guarding

method of preventing direct access to a hazard by the introduction of a tortuous path

4 List of significant hazards

For the purposes of this European Standard, Table 1 gives, for defined danger zones, all the significant hazards, the significant hazardous situations and events covered by this European Standard, that have been identified by risk assessment as being significant for this type of machine, and which require specific action to eliminate or to reduce the risk

The attention is drawn to the necessity to verify that the safety requirements specified in this European Standard apply to each significant hazard presented by a given machine and to validate that the risk assessment is complete with particular attention to:

- the intended use of the machine including maintenance, setting and cleaning and its reasonably foreseeable misuse;
- the identification of all significant hazards associated with the machine.

Table 1 — List of significant hazards associated with hand-held integrally powered garden vacuums and garden blower/vacuums with or without shredding means and garden blowers

Ref. No. a)	Hazard	Location or event	Reference of this European Standard
Hazards, hazardous situations and hazardous events			
1	Mechanical hazards due to: - machine parts or workpieces, e.g.:		
	e) inadequacy of mechanical strength;	Guard failure/strength	5.2.3, 5.2.4, 5.10.4
1.2	Shearing hazard	Contact with moving parts	5.1, 5.2.1, 6.1, 6.2 and Annex C
1.3	Cutting or severing hazard	Contact with moving parts	5.1, 5.2.1, 6.1, 6.2 and Annex C
1.4	Entanglement hazard	Contact with moving parts	5.1, 5.2.1, 6.1, 6.2 and Annex C
1.5	Drawing-in or trapping hazard	Contact with moving parts	5.1, 5.2.1, 6.1, 6.2 and Annex C
1.6	Impact hazard	Hit by thrown objects	5.1, 5.2.1, 5.2.3, 5.2.46.1, 6.2 and Annex C
2	Electrical hazards due to:		
2.1	Contact of persons with live parts (direct contact)	Contact with live parts	5.8.1, 5.8.2
2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	Contact with live parts	5.8.1
2.3	Approach to live parts under high voltage	Contact with HT ignition parts	5.8.2
3	Thermal hazards , resulting in:		
3.1	Burns, scalds and other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources	Contact with hot parts	5.2.2
4	Hazards generated by noise , resulting in:		
4.1	Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness)	Hearing damage	5.5, 6.1, 6.2 and Annex A

Ref. No. ^{a)}	Hazard	Location or event	Reference of this European Standard
5	Hazards generated by vibration		
5.1	Use of hand-held machines resulting in a variety of neurological and vascular disorders	Vibration white finger	5.6, 6.1 and Annex B
7	Hazards generated by materials and substances (and their constituent elements) processed or used by the machinery		
7.1	Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes, and dusts	Breathing engine exhaust fumes	5.7
7.2	Fire or explosion hazard	Abrasion of wire insulation etc.	5.8
8	Hazards generated by neglecting ergonomic principles in machinery design as, e.g. hazards from:		
8.1	Unhealthy postures or excessive effort	Support of heavier units	5.3.3, 5.10.3 and 6.1
8.2	Inadequate consideration of hand-arm or foot-leg anatomy	Position of controls	5.3.1
8.3	Neglected use of personal protection equipment	Eye and ear protection	6.1 and Annex C
8.7	Inadequate design, location or identification of manual controls	Position and function of controls	5.3.1, 6.2
10	Unexpected start-up, unexpected over-run/over-speed (or any similar malfunction) from:		
10.2	Restoration of energy supply after an interruption	Engine restarting after stop control operated	5.3.1.4
10.6	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities, see 8.6)	Removal of guards before stopping the machine.	5.2.1
16	Break-up during operation		
		Broken fan and/or shredding means	5.2.4
17	Falling or ejected objects or fluids		
		Thrown objects	5.2.4
^a References are according to EN 1050:1996, Annex A.			

5 Safety requirements and/or protective measures

5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this Clause. In addition, the machine shall be designed according to the principles of EN ISO 12100, for relevant but not significant hazards, which are not dealt with by this European Standard .

The tests of 5.2 shall be carried out when the temperature of the parts to be tested has stabilized to an ambient temperature of not less than 15°C.

5.2 Guarding

5.2.1 General guarding

5.2.1.1 All machines

All power driven components shall be guarded to prevent contact during normal operation.

All apertures and safety distances shall conform to 4.5.1 and 4.5.3 of EN 294:1992 or if guarding is achieved by means of a tortuous path and a straight rod of 1 m length and 12 mm diameter will not pass through the opening to contact the moving parts or if there are obstructions inside the tube then the tortuous path test of 5.2.1.2 shall apply.