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NSAI Standards

Irish Standard
I.S. EN 60335-2-72:2012

Household and similar electrical appliances - Safety -- Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use (IEC 60335-2-72:2012 (MOD))

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I.S. EN 60335-2-72:2012

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

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NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie

W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60335-2-72

August 2012

ICS 97.080

Supersedes EN 60335-2-72:2009

English version

Household and similar electrical appliances - Safety - Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use

(IEC 60335-2-72:2012, modified)

Appareils électrodomestiques et analogues -
Sécurité -
Partie 2-72: Exigences particulières pour les machines de traitements des sols avec ou sans commande de dispositif de déplacement, à usage commercial
(CEI 60335-2-72:2012, modifiée)

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke -
Teil 2-72: Besondere Anforderungen für Bodenbehandlungsmaschinen, mit oder ohne Fahrantrieb, für den gewerblichen Gebrauch
(IEC 60335-2-72:2012, modifiziert)

This European Standard was approved by CENELEC on 2012-05-03. 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.

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

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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

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Ref. No. EN 60335-2-72:2012 E

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Foreword

The text of document 61J/491/FDIS, future edition 3 of IEC 60335-2-72, prepared by SC 61J, "Electrical motor-operated cleaning appliances for commercial use", of IEC/TC 61, "Safety of household and similar electrical appliances" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60335-2-72:2012.

A draft amendment, which covers common modifications to IEC 60335-2-72, was prepared by CLC/TC 61, "Safety of household and similar electrical appliances" and approved by CENELEC.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-05-03
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2015-05-03

This document supersedes EN 60335-2-72:2009.

The principal changes in EN 60335-2-72:2012 as compared with EN 60335-2-72:2009 are as follows (minor changes are not listed):

– the title has been changed for better distinction with regard to EN 60335-2-67;

– the scope has been revised editorially to avoid misunderstandings;

– Clause 3 has been revised with regard to the requirements revised;

– the standard has been revised in general and updated regarding state-of-the-art, as far as necessary, in particular some changes have been made to Clauses 15, 22, and 25;

– the markings and instructions (Clause 7) have been revised basically;

– a new Annex DD 'Emission of acoustical noise' was added; and

– a new Annex EE 'Emission of vibration' was added.

This part 2 is to be used in conjunction with the EN 60335-1:2012 and its amendments.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to EN 60335-1.

This part 2 supplements or modifies the corresponding clauses in EN 60335-1, so as to convert that publication into the European Standard: *Safety requirements for floor treatment machines with or without traction drive, for commercial use*.

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

– unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;

– additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

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– requirements: in roman type;

– *test specifications: in italic type;*

– notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60335-2-72:2012 are prefixed “Z”.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

Endorsement notice

The text of the International Standard IEC 60335-2-72:2012 was approved by CENELEC as a European Standard with agreed common modifications.

COMMON MODIFICATIONS

1 Scope

Add the following paragraph before the last one.

"This standard deals with the reasonably foreseeable hazards presented by machines that are encountered by all persons.

However, in general, it does not take into account:

• **children** playing with the machine;

• the use of the machine by **children**;

• the use of the machine by **vulnerable people** or **very vulnerable people**.".

3 Terms and definitions

3.6.3
accessible part
Modification:
Delete “and probe 18”.

7 Marking and instructions

7.10 *Delete the following paragraphs*:

"Devices used to start/stop operational functions of the appliance, if any, shall be distinguished from other manual devices by means of shape, or size, or surface texture, or position, etc.

An indication that the device has been operated shall be given by:

• A tactile feedback or

• An audible and visual feedback.

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NOTE Z1 The sound of the motor or sound of an actuator switching ON/OFF is regarded as audible feedback. The stopping of the typical function (e.g. stopping of the vibration on the body of the appliance or of a part of it) is regarded as tactile means.

NOTE Z2 Devices used to start/stop operational functions mean devices that are operated by the user to start/stop the intended function of the appliance.

A selector switch with an off-position clearly identifiable is allowed.

An ON/OFF switch, if any, is considered a suitable device to stop operational functions. A plug is not considered a suitable device to stop operational functions, as it can be difficult to be reached by vulnerable persons.".

7.12 *Add the following paragraph after the 4th one:*

"Children should be supervised to ensure that they do not play with the appliance.".

Delete the paragraph beginning with “This appliance can be used…”.

7.12.Z1 *Delete this paragraph.*

7.12.102 Information on noise

Replace the Note by the following requirement:

"The instructions shall provide information on airborne noise emission as indicated in DD.2.7.".

7.12.103 Information on vibration

Replace the Note by the following requirement:

"The instructions shall provide information on vibration emission as indicated in EE.2.".

8 Protection against access to live parts

8.1.1 *Replace the 3rd paragraph by the following one:*

"*Test probe B of EN 61032 is applied with a force not exceeding 1 N, the appliance being in every possible position except that appliances normally used on the floor and having a mass exceeding 40 kg are not tilted. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N. If the probe then enters the opening, the test is repeated with the probe in the angled position.*".

8.2 *Modifications:*

In the 3rd sentence, replace “test probes of EN 61032” by “test probe B of EN 61032”.

In the 4th sentence, replace “test probe B and probe 18 of EN 61032 are” by “test probe B of EN 61032 is”.

20 Stability and mechanical hazards

20.2 *Replace the 1st paragraph of compliance by:*

"*Compliance is checked by inspection, by the test of 21.1 and by applying a force not exceeding 5 N by means of a test probe that is similar to test probe B of EN 61032 but having a circular stop face with a diameter of 50 mm, instead of the non-circular face.*".

25 Supply connection and external flexible cords

25.7 *Addition:*

Add the following before the last paragraph.

"

- Halogen-free thermoplastic compound sheathed.

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Their properties shall be at least those of halogen-free thermoplastic compound sheathed cords (code designation H05Z1Z1H2-F or H05Z1Z1-F);

- Cross-linked halogen-free compound sheathed.

  Their properties shall be at least those of cross-linked halogen-free thermoplastic compound sheathed cords (code designation H07ZZ-F).

NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.".

Modifications to Annexes DD and EE

In the titles of Annex DD and Annex EE, replace "(informative)" *with* "(normative)" *so as to make these two annexes normative.*

Modifications to Annexes Z

The annexes of Part 1 are applicable except as follows:

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Add the following special national conditions to Annex ZA of EN 60335-1:2012:

Annex ZA
(normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard / Harmonization Document.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause	Special national condition
7.12	**Finland**
	If a polyvinyl chloride sheathed cord is fitted, the instructions shall state that the appliance is not to be used outdoors at low temperature.
Annex A	**Germany**
	The CO-emission of LPG driven machines, intended to be used indoors, has to comply with the value specified in Annex BB. The result shall be documented.
Annex BB	**Germany**
	For machines intended to be used indoors, except single cylinder engines, the exhaust gas shall not contain more than 0,1 % volume of carbon monoxide (CO). If adjustments are necessary, the adjusting means shall be easily accessible. The measurement shall be carried out with a warm engine, idling, using 98 % propane. The revolution speed of the engine shall be documented.

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Apply the following changes to Annex ZC of EN 60335-1:2012:

Annex ZC
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
Add:				
IEC 60312-1	-	Vacuum cleaners for household use - Part 1: Dry vacuum cleaners - Methods for measuring the performance	EN 60312-1	-
IEC 62061	-	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	-
ISO 3411	-	Earth-moving machinery - Human physical dimensions of operators and minimum operator space envelope	EN ISO 3411	-
ISO 5353	-	Earth-moving machinery, and tractors and machinery for agriculture and forestry - Seat index point	EN ISO 5353	-
ISO 6344-2	-	Coated abrasives - Grain size analysis - Part 2: Determination of grain size distribution of macrogrits P12 to P220	-	-
ISO 13849-1	-	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	EN ISO 13849-1	-
ISO 13857	-	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs	EN ISO 13857	-
ISO 25119	Series	Tractors and machinery for agriculture and forestry - Safety-related parts of control systems	-	-
Replace:				
IEC 60068-2-78	2001	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001

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Annex ZE
(informative)

Specific additional requirements for appliances and machines intended for commercial use

This annex is not applicable.

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Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex I of the EU Directive 2006/42/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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Bibliography

Addition to EN 60335-1:2012:

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60335-2-10	NOTE	Harmonized as EN 60335-2-10.
IEC 60335-2-67	NOTE	Harmonized as EN 60335-2-67.
IEC 60335-2-68	NOTE	Harmonized as EN 60335-2-68.
IEC 60335-2-69	NOTE	Harmonized as EN 60335-2-69.
IEC 62638	NOTE	Harmonized as EN 62638.
ISO 3743-1	NOTE	Harmonized as EN ISO 3743-1.
ISO 3744	NOTE	Harmonized as EN ISO 3744.
ISO 4871	NOTE	Harmonized as EN ISO 4871.
ISO 5349-1	NOTE	Harmonized as EN ISO 5349-1.
ISO 7574-1	NOTE	Harmonized as EN 27574-1.
ISO 7574-4	NOTE	Harmonized as EN 27574-4.
ISO 9614-2	NOTE	Harmonized as EN ISO 9614-2.
ISO 11201	NOTE	Harmonized as EN ISO 11201.
ISO/TR 11688-1	NOTE	Harmonized as EN ISO 11688-1.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60335-2-72 has been prepared by subcommittee 61J: Electrical motor-operated cleaning appliances for commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 2002 and its Amendment 1 (2005). It constitutes a technical revision.

The principal changes in this edition as compared with the second edition of IEC 60335-2-72 are as follows (minor changes are not listed):

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The standard has be revised completely and changed significantly, in particular with regard to the following clauses:

– the title has been changed for better distinction with regard to IEC 60335-2-67;
– the scope has been revised editorially to avoid misunderstandings;
– Clause 3 has been revised with regard to the requirements revised;
– the standard has been revised in general and updated regarding state-of-the-art, as far as necessary, in particular some changes have been made to Clauses 15, 22, and 25;
– the markings and instructions (Clause 7) have been revised basically;
– a new Annex DD 'Emission of acoustical noise' was added; and
– a new Annex EE 'Emission of vibration' was added.

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

FDIS	Report on voting
61J/491/FDIS	61J/500/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 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 60335-1 and its amendments. It was established on the basis of the fifth edition (2010) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for floor treatment machines with or without traction drive, for commercial use.

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, tables and figures that are numbered starting from 101 are additional to those in Part 1;
– unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
– additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types 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 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

A list of all parts of the IEC 60335 series, under the general title: *Household and similar electrical appliances – Safety*, can be found on the IEC website.

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The committee has decided that the contents of this publication will remain unchanged until the stability 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.

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of powered ride-on and powered **walk-behind machines** intended for commercial indoor or outdoor use for the following applications:

– sweeping,
– scrubbing,
– wet or dry pick-up,
– polishing,
– application of wax, sealing products and powder based detergents,
– shampooing

of floors with an artificial surface.

Their cleaning motion is more linear than lateral or periodic.

NOTE 101 By contrast, the cleaning motion of machines covered by IEC 60335-2-67 is more lateral or periodic than linear.

NOTE 102 This standard applies to machines for **commercial use**. The following list, although not comprehensive, gives an indication of locations that are included in the scope:

– public use areas such as hotels, schools, hospitals;
– industrial locations, for example factories and manufacturing shops;
– retail outlets, for example shops and supermarkets;
– business premises, for example offices and banks;
– all uses other than normal housekeeping purposes.

They may be equipped with a **traction drive** system. The following power systems are covered:

– internal combustion engines,
– mains powered motors up to a **rated voltage** of 250 V for single-phase appliances and 480 V for other appliances,
– battery powered motors.

Battery powered machines may be equipped with a built-in battery charger.

This standard does not apply to

– floor treatment appliances for household use according to IEC 60335-2-10;
– floor treatment machines for **commercial use** according to IEC 60335-2-67;
– spray extraction machines for **commercial use** (IEC 60335-2-68);

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– wet and dry vacuum cleaners, including power brush, for **commercial use** (IEC 60335-2-69);
– road sweepers;

NOTE 103 In Europe, EN 13019 covers road sweepers.

– machines designed for use on **slopes** with a gradient exceeding 20 %;
– machines equipped with a power take-off (PTO);
– machines designed for use in corrosive or explosive environments (dust, vapour or gas);
– machines designed for picking up hazardous dusts (as defined in IEC 60335-2-69), inflammable substances, or glowing particles;
– machines designed for use in vehicles or on board of ships or aircraft.

NOTE 104 Attention is drawn to the fact that

– in many countries additional requirements on the safe use of the equipment covered can be specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities;
– **ride-on machines** designed for transport over public roads can be subject to additional requirements (e.g. lighting, license plate etc.).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60312-1, *Vacuum cleaners for household use – Part 1: Dry vacuum cleaners – Methods for measuring the performance*

IEC 62061, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*

ISO 3411, *Earth moving machinery – Human physical dimensions of operators and minimum operator space envelope*

ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry – Seat index point*

ISO 6344-2, *Coated abrasives – Grain size analysis – Part 2: Determination of grain size distribution of macrogrits P12 to P220*

ISO 13849-1, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*

ISO 13857, *Safety of machinery – Safety distances to prevent hazard zones being reached by the upper and lower limbs*

ISO 25119 (all parts), *Tractors and machinery for agriculture and forestry – Safety-related parts of control systems*

Replacement:

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

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