

Irish Standard I.S. EN IEC/ASTM 62885-7:2021

Surface cleaning appliances - Part 7: Drycleaning robots for household or similar use - Methods for measuring the performance

 $\ensuremath{\mathbb O}$  CENELEC 2021  $\hfill No copying without NSAI permission except as permitted by copyright law.$ 

#### I.S. EN IEC/ASTM 62885-7:2021

Incorporating amendments/corrigenda/National Annexes 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.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.* 

This document is based on: EN IEC/ASTM 62885-7:2021 *Published:* 2021-01-22

This document was published		ICS number:	
under the authority of the NSAI and comes into effect on:			97.080
2021-02-08			
		NOTE: If b	lank see CEN/CENELEC cover page
NSAI	T +353 1	807 3800	Sales:
1 Swift Square,	F +353 1	807 3838	T +353 1 857 6730
Northwood, Santry	E standa	Irds@nsai.ie	F +353 1 857 6729
Dublin 9	W NSAI.i	e	W standards.ie
	( a)		. <i>4</i> .

Údarás um Chaighdeáin Náisiúnta na hÉireann

# **National Foreword**

I.S. EN IEC/ASTM 62885-7:2021 is the adopted Irish version of the European Document EN IEC/ASTM 62885-7:2021, Surface cleaning appliances - Part 7: Dry-cleaning robots for household or similar use - Methods for measuring the performance

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

### Compliance with this document does not of itself confer immunity from legal obligations.

*In line with international standards practice the decimal point is shown as a comma (,) throughout this document.* 

This is a free page sample. Access the full version online.

This page is intentionally left blank

# EUROPEAN STANDARD

# EN IEC/ASTM 62885-7

# NORME EUROPÉENNE

# EUROPÄISCHE NORM

January 2021

ICS 97.080

Supersedes EN 62929:2014 and all of its amendments and corrigenda (if any)

**English Version** 

# Surface cleaning appliances - Part 7: Dry-cleaning robots for household or similar use - Methods for measuring the performance (IEC/ASTM 62885-7:2020)

Appareils de nettoyage des sols - Partie 7 : Robots de nettoyage à sec à usage domestique ou analogue -Méthodes de mesure de l'aptitude à la fonction (IEC/ASTM 62885-7:2020) Geräte zur Oberflächenreinigung - Teil 7: Trocken-Reinigungsroboter für den Hausgebrauch und ähnliche Anwendungen - Verfahren zur Messung der Gebrauchseigenschaften (IEC/ASTM 62885-7:2020)

This European Standard was approved by CENELEC on 2020-12-02. 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 CEN-CENELEC Management Centre or to any CENELEC member.

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

# EN IEC/ASTM 62885-7:2021 (E)

# European foreword

The text of document 59F/393/FDIS, future IEC/ASTM 62885-7, prepared by SC 59F "Surface cleaning appliances" of IEC/TC 59 "Performance of household and similar electrical appliances" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC/ASTM 62885-7:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2021-09-02 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2023-12-02 document have to be withdrawn

This document supersedes EN 62929:2014 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC 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.

# Endorsement notice

The text of the International Standard IEC/ASTM 62885-7:2020 was approved by CENELEC as a European Standard without any modification.

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

 IEC 60335-1:2010
 NOTE
 Harmonized as EN 60335-1:2012

 IEC 60335-2-2:2019
 NOTE
 Harmonized as EN IEC 60335-2-2:—1 (not modified)

 ISO 2768-1:1989
 NOTE
 Harmonized as EN 22768-1:1993 (not modified)

<sup>&</sup>lt;sup>1</sup> To be published. Stage at the time of publication: prEN IEC 60335-2-2:2020.

# Annex ZA (normative)

# Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: <u>www.cenelec.eu</u>.

Publication	Year	Title	<u>EN/HD</u>	<u>Year</u>
IEC 62301	-	Household electrical appliances - Measurement of standby power	EN 50564	-
IEC/TS 62885-1	-	Surface cleaning appliances - Part 1: General requirements on test material and test equipment	-	-
IEC 62885-2	2016	Surface cleaning appliances - Part 2: Dry vacuum cleaners for household or similar use - Methods for measuring the performance	-	-
IEC 60704-1	-	Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 1: General requirements	EN 60704-1	-
IEC 60704-2-17	-	Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 2-17: Particular requirements for dry-cleaning robots	EN IEC 60704-2-17	-
ISO 554	-	Standard atmospheres for conditioning and/or testing - Specifications	-	-
ISO 2813	-	Paints and varnishes - Determination of gloss value at 20 degrees, 60 degrees and 85 degrees	EN ISO 2813	-

This is a free page sample. Access the full version online.

This page is intentionally left blank





Edition 1.0 2020-10

# INTERNATIONAL STANDARD



Surface cleaning appliances – Part 7: Dry-cleaning robots for household or similar use – Methods for measuring the performance





# THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2020 IEC, Geneva, Switzerland Copyright © 2020 ASTM International

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing being secured. Requests for permission to reproduce should be addressed to either IEC at the address below or IEC's member National Committee in the country of the requester or from ASTM.

IEC Central Office 3, rue de Varembé CH-1211 Geneva 20 Switzerland Tel.: +41 22 919 02 11 info@iec.ch www.iec.ch ASTM Headquarters 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 United States of America mailto:mkhooper@astm.org www.astm.org

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

#### IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

#### IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

#### Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and definitions clause of IEC publications issued between 2002 and 2015. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.





Edition 1.0 2020-10

# INTERNATIONAL STANDARD



Surface cleaning appliances – Part 7: Dry-cleaning robots for household or similar use – Methods for measuring the performance

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 97.080

ISBN 978-2-8322-8540-4

Warning! Make sure that you obtained this publication from an authorized distributor.

## – 2 –

# IEC/ASTM 62885-7:2020 © IEC/ASTM 2020

# CONTENTS

FO	REWO	RD	6
IN	rodu	CTION	8
1	Scop	e	9
2	Norm	ative references	9
3	Term	s and definitions	9
4		ral conditions for testing	
		General.	
	4.1		
	4.2	Atmospheric conditions	
	4.3	Lighting conditions	
	4.4 4.5	Test equipment and materials Number of samples	
	4.5 4.6	Preparation of the battery	
	4.0 4.7	Running-in of a new cleaning robot	
	4.8	Operation of the cleaning robot	
	4.9	Measurement of collected dust weight	
	4.10	Measurement resolution and accuracy	
	4.11 Class	Tolerance of dimensions	
5		ning performance – Straight line	
	5.1	General	
	5.2	Preparation of test	
	5.2.1	5	
	5.2.2	5	
	5.2.3	I	
	5.3	Test mode	
	5.3.1	General	
	5.3.2		
	5.3.3	Test mode action	
	5.3.4	•	
	5.4	Dust removal from hard floor	
	5.4.1	Test bed	
	5.4.2	Preparation of test	
	5.4.3		
	5.4.4	Determination of dust removal ability	
	5.5	Dust removal from carpet	
	5.5.1	Test bed	
	5.5.2	Preparation of test	
	5.5.3		
	5.5.4	Determination of dust removal ability	
	5.6	Medium size debris removal from hard floor	
	5.6.1	Test bed	
	5.6.2	Preparation of test	
	5.6.3	Test method	
	5.6.4	Determination of medium size debris removal ability	
	5.7	Medium size debris removal from carpet	
	5.7.1	Test bed	
	5.7.2	Preparation of test	22

	C/ASTN IEC/AS		885-7:2020 - 3 - 2020	
	5.7.3	5	Test method	.22
	5.7.4	ŀ	Determination of medium size debris removal ability	.22
	5.8	Larg	e debris removal from hard floor	22
	5.8.1		Test bed	22
	5.8.2	2	Preparation of test	22
	5.8.3	}	Test method	24
	5.8.4	Ļ	Determination of large debris removal ability	.24
	5.9	Larg	e debris removal from carpet	.24
	5.9.1		Test bed	.24
	5.9.2	2	Preparation of test	24
	5.9.3	3	Test method	25
	5.9.4	Ļ	Determination of large debris removal ability	25
	5.10	Fibr	e removal from carpet	
	5.10	•••	Test bed	
	5.10		Preparation of test	
	5.10		Test method	
	5.10		Determination of fibre removal ability	
6	Mobi			
	6.1	Gen	eral	28
	6.2		t bed	
	6.3	Prep	paration of test	29
	6.3.1		Test conditions	29
	6.3.2	<u>)</u>	Preconditioning of test floor	.29
	6.3.3		Pre-treatment of cleaning robot	
	6.4		t method	
	6.4.1		General	
	6.4.2		Minimum passable gap width	
	6.4.3		Minimum passable height	
	6.4.4		Maximum passable transition height	
	6.4.5		Maximum passable threshold height	
	6.5		ermination of mobility results	
7	Auto		ous navigation/coverage test	
	7.1		eral	
	7.2	Prep	paration of test	
	7.2.1		Test bed	.34
	7.2.2	<u>)</u>	Test conditions	34
	7.3	Test	t method	34
	7.4		ormance measurement	
8	Misc	ellan	eous	.38
	8.1	Ene	rgy consumption of a cleaning robot	.38
	8.1.1		General	.38
	8.1.2	<u>)</u>	Test conditions	
	8.1.3	3	Test method	39
	8.2		orne acoustical noise	
	8.3		ight-line cleaning speed	
	8.3.1		General	41
	8.3.2		Preparation	
	8.3.3		Test method	
	8.3.4	ļ	Determination of straight-line cleaning speed	.42

	- 4 -	IEC/ASTM 62885-7:2020 © IEC/ASTM 2020
9 Test m	naterial and equipment	44
9.1 \$	Straight-line test bed	44
9.1.1	Hard floor	44
9.1.2	Carpet	
9.2 N	Mobility test bed	
9.2.1	Basic test bed configuration	45
9.2.2	Minimum passable gap width – additional equipment	
9.2.3	Minimum passable height – additional equipment	47
9.2.4	Maximum passable transition height – additional equip	oment48
9.2.5	Maximum passable threshold height – additional equip	oment48
9.3 (	Coverage test bed	
9.3.1	Floor configuration	
9.3.2	Wall and ceiling configuration	55
9.3.3	General conditions	62
10 Instruc	ctions for use	63
Annex A (ir	nformative) Calculation of coverage	64
A.1 [	Definitions	64
A.2 (	Calculating orifice pass coverage	64
Annex B (ir	nformative) Comprehensive cleaning performance metric .	
Annex C (ir	nformative/normative) Detailed images of fibre removal ab	ility67
Bibliograph	ıy	72

Figure 1 – Test mode action	17
Figure 2 – Dust distribution devices	18
Figure 3 – Large debris template	23
Figure 4 – Large debris template hole alignment	24
Figure 5 – Straight-line fibre removal from carpet test bed configuration	25
Figure 6 – Exemplary picture of fibre distribution	26
Figure 7 – Exemplary picture of judgement area	27
Figure 8 – Starting positions and orientations	30
Figure 9 – Minimum passable gap width test	30
Figure 10 – Suggested process to determine the minimum passable gap width	31
Figure 11 – Minimum passable height test	31
Figure 12 – Maximum passable transition height test	32
Figure 13 – Process to determine the maximum passable transition height	32
Figure 14 – Maximum passable threshold height test	33
Figure 15 – Starting positions for navigation test	36
Figure 16 – Exemplary graph of coverage test result	38
Figure 17 – Straight-line speed measurement areas	43
Figure 18 – Straight-line hard floor test bed configuration	44
Figure 19 – Straight-line carpet test bed configuration	45
Figure 20 – Basic test bed configuration for mobility testing	45
Figure 21 – Test bed with an additional adjustable wall	46
Figure 22 – Part 1 and part 2 of the wall	46
Figure 23 – Test bed with an additional tunnel	47

IEC/ASTM 62885-7:2020 © IEC/ASTM 2020	- 5 -	
Figure 24 – Test bed with additional	transition and its sectional view	48
Figure 25 – Test bed with additional	threshold	49
Figure 26 – Drawings of cylindrical a	and rectangular thresholds	49
Figure 27 – Navigation/coverage tes	st bed configuration	50
Figure 28 – Details of obstacles arou	und table	51
Figure 29 – Illustration of metal trans	sition installation	53
Figure 30 – Illustration of wood trans	sition installation	53
Figure 31 – Detail view of checkerbo	oard and transitions	54
Figure 32 – Configuration of four wa	Ills and ceiling	55
Figure 33 – Illustration of four-panel	door	59
Figure 34 – Illustration of window		59
Figure 35 – Illustration of skirting bo	pard	60
Figure 36 – Illustration of pendant lig	ght	60
Figure 37 – Illustration of clock		61
Figure 38 – Illustration of mirror		61
Figure 39 – Illustration of picture		62
Figure 40 – Illustration of curtains		62
Figure A.1 – Robot coordinate frame		64
Figure A.2 – Coverage step		65
Figure C.1 – Detailed images for rat	ing 1	67
Figure C.2 – Detailed images for rat	ing 2	68
Figure C.3 – Detailed images for rat	ing 3	69
Figure C.4 – Detailed images for rat	ing 4	70
Figure C.5 – Detailed images for rat	ing 5	71
Table 1 – Tolerance of dimensions .		14
Table 2 – Medium size debris		21
Table 3 – Large Debris		23
Table 4 – Rating system with exemp	blary pictures	28
Table 5 – List of described mobility t	tests	29
Table 6 – Reported results for each	mobility test	
Table 7 – Overview of duration and	the values that should be reported	40
Table 8 – Dimensions of furniture ar	nd obstacles	51
Table 9 – Wall and ceiling furniture.		56

- 6 -

IEC/ASTM 62885-7:2020 © IEC/ASTM 2020

# INTERNATIONAL ELECTROTECHNICAL COMMISSION

# SURFACE CLEANING APPLIANCES -

# Part 7: Dry-cleaning robots for household or similar use – Methods for measuring the performance

# 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 deall with may participate in this preparatory work. International, governmental and non-governmental organizations for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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/ASTM 62285-7 has been prepared by subcommittee 59F: Surface cleaning appliances, of IEC technical committee 59: Performance of household and similar electrical appliances, in co-operation with ASTM Committee F11: Vacuum cleaners, under the IEC/ASTM Dual Logo Agreement.

It is published as a dual logo standard.

This first edition of IEC/ASTM 62885-7 cancels and replaces IEC 62929:2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 62929:2014:

- a) the box test has been cancelled;
- b) the set of straight-line tests have been extended to contain also tests on removal of different kinds of debris both from hard floors and carpets;
- c) the set of straight-line tests also contains a test on the removal of fibres from carpets;

### IEC/ASTM 62885-7:2020 © IEC/ASTM 2020

- 7 -

- d) as a miscellaneous test, a method for the determination of energy consumption has been added;
- e) a separate clause on test material and equipment has been added.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
59F/393/FDIS	59F/401/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

- terms defined in Clause 3: **bold type**.

A list of all parts in the IEC 62885 series, published under the general title *Surface cleaning appliances*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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.

## - 8 -

IEC/ASTM 62885-7:2020 © IEC/ASTM 2020

# INTRODUCTION

In addition to the performance measurement methods that are included in this International Standard, a few more performance items have been reviewed and considered. The list of the performance items that have been discussed over time but have not yet been included comprises corner/edge dust pick-up, docking, fall-off prevention, and dust re-emissions.

The performance items that have been left out in this edition will be continuously reviewed and will soon be included in future editions of this document.

IEC/ASTM 62885-7:2020 © IEC/ASTM 2020

# SURFACE CLEANING APPLIANCES -

# Part 7: Dry-cleaning robots for household or similar use – Methods for measuring the performance

## 1 Scope

This part of IEC 62885 is applicable to **dry-cleaning robots** for household use or under conditions similar to those in households.

The purpose of this document is to specify the essential performance characteristics of **dry-cleaning robots** that are of interest to users and to describe methods for measuring these characteristics.

This document is neither concerned with safety requirements nor with performance requirements.

# 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62301, Household electrical appliances – Measurement of standby power

IEC TS 62885-1, Surface cleaning appliances – Part 1: General requirements on test material and test equipment

IEC 62885-2:2016, Surface cleaning appliances – Part 2: Dry vacuum cleaners for household or similar use – Methods for measuring the performance

IEC 60704-1, Household and similar electrical appliances –Test code for the determination of airborne acoustical noise – Part 1: General requirements

IEC 60704-2-17, Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-17: Particular requirements for dry cleaning robots

ISO 554, Standard atmospheres for conditioning and/or testing – Specifications

ISO 2813, Paints and varnishes – Determination of gloss value at 20 degrees, 60 degrees and 85 degrees

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62885-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp



This is a free preview. Purchase the entire publication at the link below:

**Product Page** 

S Looking for additional Standards? Visit Intertek Inform Infostore

> Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation