IEC 62885-3

Edition 1.0 2014-12

INTERNATIONAL STANDARD

colour inside

Surface cleaning appliances –
Part 3: Wet carpet cleaning appliances – Methods for measuring the performance

IEC 62885-3:2014-12(en)

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SURFACE CLEANING APPLIANCES –

Part 3: Wet carpet cleaning appliances – Methods for measuring the performance

FOREWORD

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International Standard IEC 62885-3 has been prepared by subcommittee 59F: Surface cleaning appliances, of IEC technical committee 59: Performance of household and similar electrical appliances.

This first edition cancels and replaces the first edition of IEC 60312-2 published in 2010. This edition constitutes a technical revision.

This edition includes a complete revision of the wet carpet cleaning test in Clause 5 and changes related to this test. The International Standard has also been limited to tests on carpets.

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

FDIS	Report on voting
59F/269/FDIS	59F/273/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.

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

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- withdrawn,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 publication 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.

SURFACE CLEANING APPLIANCES –

Part 3: Wet carpet cleaning appliances – Methods for measuring the performance

1 Scope

This part of IEC 62885 is applicable to wet cleaning appliances for household use for carpet cleaning in or under conditions similar to those in households. This part of IEC 62885 is not applicable to steam cleaning vacuums.

The purpose of this standard is to:

– specify the essential performance characteristics of wet cleaning appliances being of interest to users

– describe methods for measuring these characteristics and

– be complementary to the methods for dry vacuum cleaners in IEC 60312-1.

NOTE Due to influence of environmental conditions, variations in time, origin of test materials and proficiency of the operator, most of the described test methods will give more reliable results when applied for comparative testing of a number of appliances at the same time, in the same laboratory and by the same operator.

See IEC 60335-1 and IEC 60335-2-2 for safety requirements.

Wet hard floor tests are under consideration and are intended to be published in a separate standard.

2 Normative references

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.

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

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

ASTM F2828-12, *Standard test method for assessing carpet cleaning effectiveness in terms of visual appearance change when cleaned with a wet extraction cleaning system*

ASTM D6540, *Standard test method for accelerated soiling of pile yarn floor covering*

AATCC Test Method 122-2009, *Carpet soiling: service soiling method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
cleaning head
plain nozzle or a brush attached to a connecting tube, or a power nozzle, separate or part of the appliance housing, and that part of a vacuum cleaner which is applied to a surface to be cleaned

[SOURCE: IEC 60312-1:2010, 3.3]

3.2
active nozzle
cleaning head provided with an agitation device to assist dirt removal

Note 1 to entry: The agitation device may be driven by an incorporated electric motor (motorized nozzle), an incorporated turbine powered by the air flow (air-turbine nozzle) or an incorporated friction or gear mechanism actuated by moving the cleaning head over the surface to be cleaned (mechanical nozzle).

[SOURCE: IEC 60312-1:2010, 3.4]

3.3
self-propelled cleaning head
cleaning head provided with a propulsion mechanism

3.4
extractor
wet cleaning appliance with the cleaning head forming an integral part of or directly connected to the cleaner housing, the cleaning head may be provided with an agitation device to assist dirt removal and the complete cleaner housing being moved over the surface to be cleaned by means of an attached handle

3.5
forward stroke
forward movement of a stroke pattern

Note 1 to entry: On test carpets, forward strokes are normally carried out in the direction of the carpet pile (direction of manufacture) unless otherwise indicated.

[SOURCE: IEC 60312-1:2010, 3.15]

3.6
return stroke
backward movement of a stroke pattern

[SOURCE: IEC 60312-1:2010, 3.16]

3.7
stroke speed
speed of the cleaning head, moved as uniformly as possible, during a forward or a return stroke

[SOURCE: IEC 60312-1:2010, 3.12]

3.8
stroke length
distance between the two parallel lines defining the limits of a stroke pattern

[SOURCE: IEC 60312-1:2010, 3.13]

3.9
stroke pattern
arrangement of the forward and return strokes on the surface to be cleaned

[SOURCE: IEC 60312-1:2010, 3.10]

3.10
cleaning cycle
for a given measurement, the sequence of forward and return strokes to be carried out at a specified stroke speed over the test area according to the appropriate stroke pattern

3.11
wet cleaning appliance
electrically operated appliance that applies cleaning solution and removes soil together with solution from the surface to be cleaned by an airflow created by a vacuum developed within the unit

Note 1 to entry: The material and solution thus removed is separated in the appliance and the cleaned dry suction air is returned to the ambient.

3.12
passive nozzle
cleaning head without any agitation devices

[SOURCE: IEC 60312-1:2010, 3.5]

3.13
cleaning head width
external maximum width of the cleaning head in millimetres

[SOURCE: IEC 60312-1:2010, 3.7, modified – "metres" has been replaced by "millimetres".]

3.14
steam vacuum cleaner
electrically operated appliance producing wet steam heat (steam generated from water only or a water solution mix) to moisten an absorbent pad for surface removal of soil stains

Note 1 to entry: A steam vacuum cleaner may employ an additional dry cleaning function to remove dry surface debris.

Note 2 to entry: Evaluation of the cleaning performance of a steam vacuum cleaner on hard surfaces is covered under IEC 60312-4 .

4 General conditions for testing

4.1 Atmospheric conditions

Unless otherwise specified, the test procedures and measurements shall be carried out under the following conditions (in accordance with ISO 554):

Temperature: (23 ± 2) °C

Relative humidity: (50 ± 5) %

Air pressure: 86 kPa to 106 kPa

Temperature and humidity conditions within the specified ranges are required for good repeatability and reproducibility. Care should be taken to avoid changes during a test.

If test procedures and measurements are carried out at other than standard atmospheric conditions, the ambient temperature shall be maintained at (23 ± 5) °C.

4.2 Test equipment and materials

Measurements on carpets shall be carried out on a flat floor consisting of a smooth untreated pine plywood or equivalent panel, at least 15 mm thick and of a size appropriate for the test.

Equipment and materials for measurements (devices, test carpets, soil, test dust, etc.) to be used in a test shall, prior to the test, be kept for at least 16 h at standard atmospheric conditions according to 4.1.

It is recommended that carpets that are already being used shall be stored unbeaten at standard atmospheric conditions according to 4.1. When not in use they should be hanging free, not lying or rolled.

4.3 Voltage and frequency

Measurements shall be carried out at rated voltage with a tolerance of ±1 % and, if applicable, at rated frequency.

Wet cleaning appliances designed for d.c. only shall be operated at d.c. Wet cleaning appliances designed for both a.c. and d.c. shall be operated at a.c. Wet cleaning appliances not marked with rated frequency shall be operated at either 50 Hz or 60 Hz, as is common in the country of use.

For wet cleaning appliances with a rated voltage range, measurements shall be carried out at the mean value of the voltage range if the difference between the limits of the range does not exceed 10 % of the mean value. If the difference exceeds 10 % of the mean value, measurements shall be carried out both at the upper and lower limits of the voltage range.

If the rated voltage differs from the nominal system voltage of the country concerned, measurements carried out at rated voltage may give test results misleading for the consumer and additional measurements may be required. If the test voltage differs from the rated voltage, this shall be reported.

4.4 Running-in of wet cleaning appliance and attachments

Prior to the initial test, the wet cleaning appliances and their attachments, if any, shall be kept running with unrestricted air flow for at least 2 h to ensure adequate running-in. For extractors with agitation or power nozzles, the agitation device shall be running but not in contact with the floor. Cleaning solution is not to be dispensed during this running-in period.

Prior to conducting any series of tests, the age, condition, and history of the product shall be recorded.

Clean water should be flushed through unit prior to testing (pump does not need to be run-in other than when flushing the unit with clean water.

4.5 Equipment of the wet cleaning appliance

Maintenance & replacement of the wet cleaning appliance components should be addressed as per the product instruction guide.

4.6 Operation of the wet cleaning appliance

The wet cleaning appliance and its accessories shall be used and adjusted in accordance with the manufacturer's instructions for normal operation for the test to be carried out.

The tube grip of cleaners with suction hose or the handle of other cleaners shall be held as for normal operation at a height of (800 ± 50) mm above the test floor.

4.7 Conditioning prior to tests

If the wet cleaning appliance is unused and de-energized for more than 1 h, then the wet cleaning appliance and attachments to be used shall be kept running for at least 10 minutes under the provisions given in 4.4 to allow them to stabilise. Cleaning solution is not to be dispensed during this 10 minute warm-up period.

All measurements of performance shall be carried out on the same sample(s) of the wet cleaning appliance with its accessories and attachments, if any.

It is recommended that a minimum of three should be used to achieve statistically significant results.

Tests carried out to simulate stresses that a wet cleaning appliance may be exposed to during normal use, possibly causing impairment of the cleaner's performance, may require additional samples of replaceable parts. Such tests shall be carried out at the end of the test programme.

4.8 In-house reference cleaner system(s)

It is required that in-house reference cleaner system(s) be used to regularly check and ensure the test is in control and cleaning results are not shifting due to possible batch to batch variability in carpet soil, lot to lot variability in carpeting, etc.

5 Cleaning tests

5.1 Dry cleaning tests

For combined dry and wet cleaning appliances the performance related to dry cleaning shall be measured by applying the methods in IEC 60312-1.

Where appropriate dry cleaning tests are required, methods included in IEC 60312-1 shall be used.

5.2 Wet cleaning tests

5.2.1 Wet cleaning effectiveness on carpet

5.2.1.1 General

The purpose of this test is to evaluate the cleaning performance of a wet cleaning appliance with recommended detergent (if any) and the wet cleaning functions of combined dry and wet cleaning appliances with recommended detergent (if any).

The cleaning effectiveness is determined from measurements of colour (L*a*b*) change in identically treated carpet samples using colorimeter instrumentation.

In addition to colorimeter measurements, cleaned carpet samples may be assessed visually with respect to fabric appearance, streaks and blotches.

This method is described in full in ASTM F2828-12.

5.2.1.2 Test procedure overview

This procedure employs an accelerated soiling process using polymer pellets to uniformly transfer a synthetic soil to carpet samples. At least six carpet samples shall be used for a wet cleaning appliance test. Three carpet samples shall be cleaned in the direction of the pile lean and three carpet samples shall be cleaned against the direction of pile lean. The carpet samples shall be taken from the same production batch.

5.2.1.3 Summary of test procedure steps

5.2.1.3.1 Details of full procedure may be found in ASTM F2828-12.

5.2.1.3.2 Polymer pellets (nylon) are soiled using a pellet soiling cylinder rotated a prescribed number of minutes in each of two directions. A prescribed ratio in grams of pellets to grams of AATCC TM122 synthetic soil is used to effectively transfer the soil to the pellets. (See 7.2.1 for AATCC TM122 soil specification and the example of unsoiled and soiled pellets in Figure 1.)

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Figure 1 – Polymer pellets – Unsoiled vs. soiled

5.2.1.3.3 Test carpet samples are prepared by cutting carpet into panels 450 mm wide and 900 mm long, with the long dimension always in the direction of pile lean. The carpet recommended for this test is in 7.2.2.

5.2.1.3.4 Unsoiled carpet samples are first vacuum cleaned using an electric power nozzle with horizontal brush roll that is dedicated to cleaning new, unsoiled carpeting. The whole surface of each sample is covered with a prescribed number of double cleaning strokes with the forward strokes against the direction of the pile lean at a prescribed stroke speed. Afterward, the unsoiled carpet panels are groomed in the direction of the pile lean using a weighted carpet grooming rake dedicated for grooming new, unsoiled carpeting to return the carpet fibers to their natural lean condition (see example rake in Figure 2). Immediately after grooming, color measurement readings (in L*a*b*) are taken at 10 fixed locations on the carpet employing a template that fixes the position of the carpet sample to ensure that the same locations of the carpet sample are measured at each step of the carpet cleaning and measurement process (unsoiled, soiled, and when dry after wet cleaning). (See an example color measurement template in Figure 3).

NOTE Three separately dedicated vacuums and weighted grooming rakes are employed in this procedure to prevent transfer of soil residue from soiled carpets to unsoiled and cleaned carpets during multiple executions of this procedure.

IEC

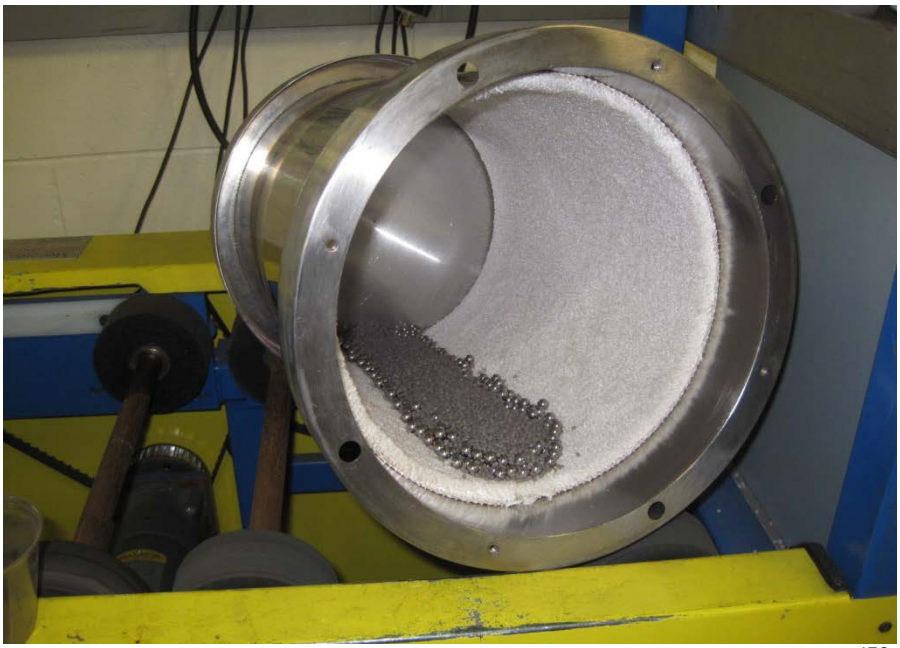
Figure 2 – Carpet grooming tool with weight

IEC

Figure 3 – Carpet colour measurement template and colorimeter

5.2.1.3.5 The unsoiled carpet samples are then artificially soiled using the ASTM D6540 test method for accelerated soiling of pile yarn floor covering. Carpet samples are placed in a soiling cylinder along with a pre-determined amount of soiled polymer pellets and chrome alloy steel balls, and then rotated at a prescribed speed for a prescribed number of minutes in each of two directions to embed the soil into the carpet fibres. (A typical carpet soiling cylinder prepared for accelerated soiling can be seen in Figure 4).

The targeted soiling level of the carpet samples is defined in terms of a ΔE change in colour shift between unsoiled and soiled carpet conditions. The carpet samples are then removed from the soiling cylinders, soiling pellets and chrome alloy steel balls are manually removed, and then vacuum cleaned using a separate electric power nozzle with horizontal brush roll dedicated to cleaning soiled carpeting. The same vacuuming, grooming, and colour reading process is followed as in 5.2.1.3.4 above.



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a) Carpet soiling cylinder

IEC

b) Soiled polymer pellets in cylinder

Figure 4 – Carpet soiling cylinder prepared for soiling

5.2.1.3.6 The wet cleaning appliance is then prepared as per the manufacturer's recommendations with the manufacturer's recommended cleaning solution. Three soiled carpet samples are then cleaned in the direction of the pile lean, and three carpet samples are cleaned against the direction of the pile lean for a total of six carpets cleaned. (See an example of a carpet cleaning template in Figure 5).

The cleaning cycle used for the wet cleaning appliance under test is controlled to two double strokes; one double stroke while dispensing cleaning solution (wet strokes), and one double

stroke without dispensing cleaning solution (dry-vacuuming strokes). This cleaning cycle is performed at a prescribed and controlled stroke speed. The cleaned carpets are then set aside and allowed to dry for at least 16 h or until completely dry. (See an example of a carpet drying rack in Figure 6).

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Figure 5 – Carpet cleaning template with stroke pace setting device

IEC

Figure 6 – Carpet drying rack

5.2.1.3.7 After the cleaned carpet samples have dried, the carpet samples are again vacuum cleaned using a separate electric power nozzle with horizontal brush roll dedicated for cleaning cleaned carpeting. The same vacuuming, grooming, and colour reading process is followed as in 5.2.1.3.4.

5.2.1.4 Determination of wet cleaning effectiveness

5.2.1.4.1 General

The final cleaned result for a given model is the average of the results for all carpets cleaned by all of the individual test units. For each carpet sample, the cleaning effectiveness (%), is calculated from the following Formula (1):

$$(1 - (\Delta E_1/\Delta E_2)) \times 100 \quad (1)$$

where

ΔE_1 is the colour change between the cleaned and the unsoiled carpet samples;

ΔE_2 is the colour change between the soiled and the unsoiled carpet samples.

The model's cleaning effectiveness is calculated as the mean of the results obtained for all the carpet samples used in the test. If the data results do not meet the precision statements of the ASTM F2828-12 standard, additional testing is required for use in predicting model performance.

5.2.1.4.2 Visual assessment

The visual assessment of cleaned carpet samples shall be conducted in a light box suitable for accommodating at least three samples. One of the samples shall be unsoiled and one soiled. The assessment shall be carried out by three independent observers.

5.2.2 Re-soiling

A test to measure the effects of re-soiling after an initial cleaning is under consideration.

5.2.3 Drying time

A test to measure time taken for drying after cleaning is under consideration.

5.2.4 Maximum usable capacity of dirt recovery receptacle

A test to measure the usable volume of the dirt recovery receptacle is under consideration.

5.2.5 Maximum usable capacity of cleaning liquid dispensing tank

A test to measure the maximum usable capacity of the cleaning liquid dispensing tank is under consideration.

5.2.6 Maximum flow rate of cleaning liquid

A test to measure the maximum flow rate of the cleaning liquid is under consideration.

5.2.7 Maximum pick up rate of soiled liquid

A test to measure the maximum pick up rate of soiled liquid is under consideration.

5.2.8 Wet cleaning of hard surfaces

A test to measure the wet cleaning performance on hard surfaces is under consideration.

5.2.9 Wet cleaning of upholstery

A test to measure the performance of wet cleaning of upholstery is under consideration.

6 Miscellaneous tests

6.1 General

The tests described in this Clause 6 are intended for the determination of such characteristics of a wet cleaning appliance which relate to ease of handling or to the performance of the cleaner when it, its accessories or attachments have been subjected to stresses likely to appear during normal use. The ability of a cleaner to resist such stresses may be verified by submitting it to the appropriate tests of Clause 5 as applicable. Suitable tests from IEC 60312-1:2010, Clause 6 may also be applied where appropriate.

6.2 Motion resistance

Under consideration.

6.3 Life test

Under consideration.

6.4 Mass

The mass of the wet cleaning appliance, attachments and accessories, if any, shall be determined and reported. The mass of the wet cleaning appliance does not include cleaning solution but does include the contribution of the power supply cord and the accessories placed inside the accessory compartment, if provided, and shall be reported in grams.

NOTE Standard atmospheric conditions according to 4.1 are not required.

6.5 Weight in hand

This test method is under development.

6.6 Specific cleaning time

Under consideration.

6.7 Dimensions

Only those dimensions of importance for the storage of the appliance shall be reported. All dimensions shall be reported in millimetres (mm).

6.8 Noise level

Under consideration for wet cleaning appliances.

6.9 Energy consumption

Under consideration for wet cleaning appliances.

7 Test material and equipment

7.1 General

This Clause 7 contains information on material and on the principal designs of suitable equipment to be used in various tests. It should be noted that only as far as possible the composition of a material (see Annex A) has been specified.

7.2 Materials

7.2.1 Synthetic soil

AATCC TM122 Soil Elements by weight percentage:

Peat moss (dark)	38,0 %
Portland cement	17,0 %
Kaolin clay	17,0 %
Silica (200 mesh)	17,0 %
Carbon black	1,75 %
Red iron oxide	0,50 %
Mineral oil	8,75 %

7.2.2 Carpet specifications

A carpet with the following features is suitable for wet cleaning test on carpets:

Style Name: Atherton Plus[1]
Style Number: 52A36
Treatment: Untreated for soil & stain protection
Colour: 00103 Cashmere
Style: tufted, Saxony cut pile
Fibre content: 100 % continuous filament nylon
Face weight: 850 gm/m^2 (25,00 oz/yd^2)
Finished pile thickness: 13,5 mm (0,53 in)
Gauge: 5/32
Tufts per inch: 8
Primary backing: Polypropylene
Secondary backing: CLASSICBAC

An alternative carpet with the following features may be used (the actual carpet used shall be reported):

Type:	tufted velour
Style:	Modena[2]
Wear layer:	100 % polyamide
Fiber:	polypropylene – fleece
Backing:	non-coated textile
Pile Height:	(5 ± 0,5) mm
Thickness:	(8 ± 0,5) mm in total
Colour:	light beige

[1] Atherton Plus is the trade name of a product supplied by Shaw. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

[2] Modena is the trade name of a product supplied by Vorwerk. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

8 Instructions for use

The manufacturer's instructions for use shall contain information about the use of the appliance and its accessories, if any, and about the cleaning necessary to ensure the proper performance of the appliance.

Annex A
(informative)

Information on materials

For the convenience of users of this International Standard, information on suppliers of test materials and details of test equipment are available on the IEC website. This information can be accessed via a link that can be found in the abstract of IEC 62885-3 on the IEC website – webstore.iec.ch. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the suppliers named.

This information will be continuously updated.

Annex B
(informative)

Information at the point of sale

The following information for the consumer shall be provided at the point of sale, if applicable:

a) type of cleaner;
b) voltage/voltage range (V);
c) frequency (Hz);
d) power input (W);
e) cord length (m);
f) weight (g) (the weight of the cleaning appliance, including attachments and accessories, but excluding cleaning solution);
g) dimensions (mm) (dimensions concerning the storage of the vacuum cleaner).

Bibliography

IEC 60335-1:2010, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60335-2-2:2009*, Household and similar electrical appliances – Safety – Part 2-2: Particular requirements for vacuum cleaners and water-suction cleaning appliances*

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

IEC 60704-2-1, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-1: Particular requirements for vacuum cleaners*

ISO 679, *Cement – Test methods – Determination of strength*

CIE 15.2:1986, *Colorimetry*

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Information on test materials and equipment referred to in IEC 62885-3

The following information on supplies of test materials and details of test equipment are listed for the convenience of user of the International Standard IEC 62885-3. The information listed does not constitute an endorsement by IEC of the suppliers named.

Note: This information was in earlier editions published as an informative Annex at the end of the publication (Annex A)

7.2.1 Synthetic Soil

SDL Atlas USA,
3934 Airway Drive, Rock
Hill, SC 29732, USA
Phone: +1 (803) 329-2110
Website: www.sdltlas.com
Ordering information: AATCC soil, Catalog # TA2M/9

7.2.2 Standard Carpets

Professional Testing Laboratory
714 Glenwood Place
Dalton, Georgia 30721, USA
Phone: +1 (706) 226-3283
Website: www.professionaltesting.us/
Ordering information: Atherton Plus, Style #52A36, untreated carpet

Vorwerk & Co Teppichwerke GmbH & Co KG
Kuhlmannstrasse 11
D-31785 Hameln
Germany
Phone: (49) 5151 103 734
Fax: (49) 5151 103 502
www.vorwerk-carpet.com
e-mail: export@vorwerk-teppich.de
Ordering information: "MODENA" FB 82611

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