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BSI Standards Publication

# Vacuum cleaners for household use

Part 1: Dry vacuum cleaners — Methods for measuring the performance (IEC 60312-1:2010, modified + A1:2011, modified)

# National foreword

This British Standard is the UK implementation of EN 60312-1:2017. It is derived from IEC 60312-1:2010, incorporating amendment 1:2011. It supersedes BS EN 60312-1:2013 which will be withdrawn on 2 January 2020.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by [C⟩ ⟨C].

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by [A1⟩ ⟨A1].

The UK participation in its preparation was entrusted to Technical Committee CPL/59/6, Floor treatment appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

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


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**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2017.

**Amendments/corrigenda issued since publication**

| Date | Text affected |
|---|---|
| 31 December 2017 | Common modifications of EN 60312-1:2013 implemented in text |

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 60312-1

February 2017

ICS 97.080

Supersedes EN 60312-1:2013

English Version

# Vacuum cleaners for household use - Part 1: Dry vacuum cleaners - Methods for measuring the performance (IEC 60312-1:2010 , modified + A1:2011 , modified)

Aspirateurs de poussière à usage domestique - Partie 1: Aspirateurs a sec - Méthodes de mesure de l'aptitude à la fonction
(IEC 60312-1:2010 , modifiée + A1:2011 , modifiée)

Staubsauger für den Hausgebrauch - Teil 1: Trockensauger - Prüfverfahren zur Bestimmung der Gebrauchseigenschaften
(IEC 60312-1:2010 , modifiziert + A1:2011 , modifiziert)




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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 60312-1:2017 E

## European foreword

This document (EN 60312-1:2017*)* consists of the text of IEC 60312-1:2010+A1:2011 prepared by SC 59F, "Surface cleaning appliances", of IEC/TC 59, "Performance of household and similar electrical appliances", together with the common modifications prepared by CLC/TC 59X, "Performance of household and similar electrical appliances".

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) 2018-01-02
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-01-02

The common modifications of EN 60312-1:2013 still apply. They are partly modified.

Clauses, subclauses, notes, tables and figures which are additional to those in IEC 60312-1:2010 are prefixed “Z”.

This European Standard also specifies, as far as necessary, the test methods which shall be applied in accordance with the standardisation mandate M540 related to Council Directive 92/75 of the European Commission.

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 ZZA and ZZB, which are integral parts of this document.

## Endorsement notice

The text of the International Standard IEC 60312-1:2010+A1:2011 was approved by CENELEC as a European Standard with agreed common modifications.

COMMON MODIFICATIONS

## Annex ZA
(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 |
|---|---|---|---|---|
| IEC 60688 | - | Electrical measuring transducers for converting A.C. and D.C. ectrical quantities to analogue or digital signals | EN 60688 | - |
| IEC 60704-1 | - | Household and similar electrical appliances - Test code for the determination of airborne noise - Part 1: General requirements | EN 60704-1 | - |
| 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 | EN 60704-2-1 | - |
| ISO 554 | - | Standard atmospheres for conditioning and/or testing - Specifications | - | - |
| ISO 679 | - | Methods of testing cements - Determination of strength | - | - |
| ISO 1763 | - | Carpets - Determination of number of tufts and/or loops per unit length and per unit area | - | - |
| ISO 1765 | - | Machine-made textile floor coverings - Determination of thickness | - | - |
| ISO 1766 | - | Textile floor coverings - Determination of thickness of pile above the substrate | - | - |
| ISO 2424 | - | Textile floor coverings - Vocabulary | - | - |
| ISO 2439 | - | Flexible cellular polymeric materials - Determination of hardness (indentation technique) | EN ISO 2439 | - |
| ISO 3386-1 | - | Polymeric materials, cellular flexible - Determination of stress-strain characteristics in compression - Part 1: Low-density materials | EN ISO 3386-1 | - |
| ISO 5167-1 | - | Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements | EN ISO 5167-1 | - |
| ISO 8543 | - | Textile floor coverings - Methods for determination of mass | - | - |
| ISO 12103-1 | - | Road vehicles - Test dust for filter evaluation - Part 1: Arizona test dust | - | - |

## Annex ZB
(normative)

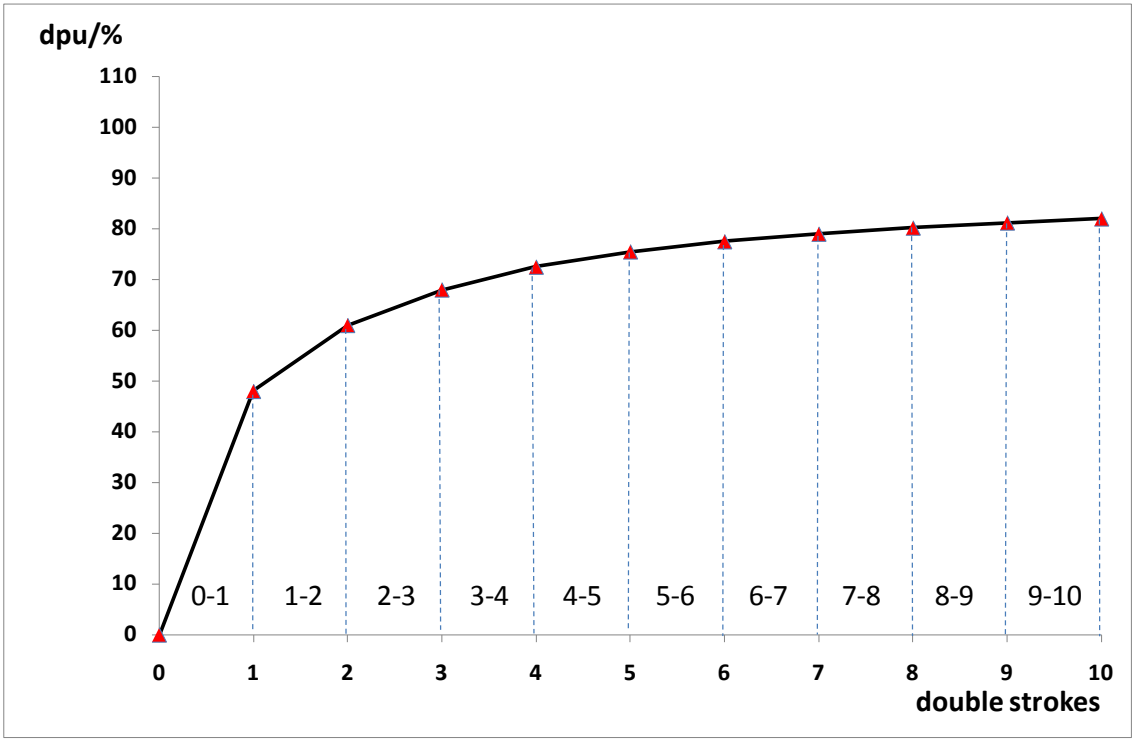
### Calculation of the number of double strokes $X_{calc}$ to reach the reference level $K_{ref}$ for hard floor with crevice and normalised reference level $K_{calc}$ for carpet.

All dust pick up measurements from zero to ten will be plotted on a graph and the points connected by straight lines as shown in figure below. Each section is described by a linear equation as follows:

$$dpu_{calc} = mX + k$$

where
$dpu_{calc}$ is the calculated dust pick up by linear equation in %
m is the slope of the linear equation
k is the intersection of each section with the y-axis

| double stroke | dust pick up | section | slope | intersection | argument |
|---|---|---|---|---|---|
| 1 | $dpu_1$ | 0-1 | $m_1$ | $k_1$ | $X_1$ |
| 2 | $dpu_2$ | 1-2 | $m_2$ | $k_2$ | $X_2$ |
| 3 | $dpu_3$ | 2-3 | $m_3$ | $k_3$ | $X_3$ |
| 4 | $dpu_4$ | 3-4 | $m_4$ | $k_4$ | $X_4$ |
| 5 | $dpu_5$ | 4-5 | $m_5$ | $k_5$ | $X_5$ |
| 6 | $dpu_6$ | 5-6 | $m_6$ | $k_6$ | $X_6$ |
| 7 | $dpu_7$ | 6-7 | $m_7$ | $k_7$ | $X_7$ |
| 8 | $dpu_8$ | 7-8 | $m_8$ | $k_8$ | $X_8$ |
| 9 | $dpu_9$ | 8-9 | $m_9$ | $k_9$ | $X_9$ |
| 10 | $dpu_{10}$ | 9-10 | $m_{10}$ | $k_{10}$ | $X_{10}$ |



〈C〉 Calculation of all slopes, intersections and arguments as follow:

NOTE In case of carpet $K_{ref}$ is to be replaced by $k_{calc}$

$m_1 = dpu_1$ $\quad X_1 = (K_{ref}/ m_1$ $\quad k_1 = 0$

$m_2 = dpu_2 - dpu_1$ $\quad X_2 = (K_{ref} – k_2) / m_2$ $\quad k_2 = dpu_1 – m_2$

$m_3 = dpu_3 - dpu_2$ $\quad X_3 = (K_{ref} – k_3) / m_3$ $\quad k_3 = dpu_2 – 2 \times m_3$

$m_4 = dpu_4 - dpu_3$ $\quad X_4 = (K_{ref} – k_4) / m_4$ $\quad k_4 = dpu_3 – 3 \times m_4$

$m_5 = dpu_5 - dpu_4$ $\quad X_5 = (K_{ref} – k_5) / m_5$ $\quad k_5 = dpu_4 – 4 \times m_5$

$m_6 = dpu_6 - dpu_5$ $\quad X_6 = (K_{ref} – k_6) / m_6$ $\quad k_6 = dpu_5 – 5 \times m_6$

$m_7 = dpu_7 – dpu_6$ $\quad X_7 = (K_{ref} – k_7) / m_7$ $\quad k_7 = dpu_6 – 6 \times m_7$

$m_8 = dpu_8 – dpu_7$ $\quad X_8 = (K_{ref} – k_8) / m_8$ $\quad k_8 = dpu_7 – 7 \times m_8$

$m_9 = dpu_9 – dpu_8$ $\quad X_9 = (K_{ref} – k_9) / m_9$ $\quad k_9 = dpu_8 – 8 \times m_9$

$m_{10} = dpu_{10} – dpu_9$ $\quad X_{10} = (K_{ref} – k_{10}) / m_{10}$ $\quad k_{10} = dpu_9 – 9 \times m_{10}$

The choice of the right section, where the reference level $K_{ref}$ for hard floor with crevice and normalised reference level $K_{calc}$ for carpet is located has to be done as follows:

when $dpu_1 > K_{ref}$ then $X_{calc} = X_1$

when $dpu_2 >= K_{ref}$ and $dpu_1 < K_{ref}$ then $X_{calc} = X_2$

when $dpu_3 >= K_{ref}$ and $dpu_2 < K_{ref}$ then $X_{calc} = X_3$

when $dpu_4 >= K_{ref}$ and $dpu_3 < K_{ref}$ then $X_{calc} = X_4$

when $dpu_5 >= K_{ref}$ and $dpu_4 < K_{ref}$ then $X_{calc} = X_5$

when $dpu_6 >= K_{ref}$ and $dpu_5 < K_{ref}$ then $X_{calc} = X_6$

when $dpu_7 >= K_{ref}$ and $dpu_6 < K_{ref}$ then $X_{calc} = X_7$

when $dpu_8 >= K_{ref}$ and $dpu_7 < K_{ref}$ then $X_{calc} = X_8$

when $dpu_9 >= K_{ref}$ and $dpu_8 < K_{ref}$ then $X_{calc} = X_9$

when $dpu_{10} >= K_{ref}$ and $dpu_9 < K_{ref}$ then $X_{calc} = X_{10}$

when $dpu_{10} <= K_{ref}$ then $X_{calc} = X_{10}$" 〈C〉

## 〈C〉 Annex ZZA
(informative)

### Relationship between this European Standard and the energy labelling requirements of Commission Delegated Regulation (EU) No 665/2013 aimed to be covered

This European standard has been prepared under a Commission's standardisation request **'M/540' / 'C(2015) 8753 final'** to provide one voluntary means of conforming to the energy labelling requirements of Commission Delegated Regulation (EU) No 665/2013 of 3 May 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of energy labelling of vacuum cleaners [OJEU L192 of 13 July 2013].

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding energy labelling requirements of that Regulation and associated EFTA Regulations.

**Table ZZA.1 – Correspondence between this European Standard and Commission Delegated Regulation (EU) No 665/2013 of [3 May 2013] supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of k vacuum cleaners [OJEU L192 of 13 July 2013] and Commission's standardisation request 'M/540' / 'C(2015) 8753 final'**

| Energy labelling requirements of Regulation No 665/2013 [OJEU L192] | Clause(s) / sub-clause(s) of this EN | Remarks / Notes |
|---|---|---|
| annual energy consumption | 6.16 | |
| rated input power | | see list of harmonised standards (OJEU 2014/C 272/06)<br>EN 60335-2-2:2010/A11:2012<br>EN 60335-2-2:2010/A1:2013<br>IEC 60335-2-2:2009/A1:2012 |
| dust pick up on carpet ($dpu_c$) | 5.3 in conjunction with 6.Z1.2 | |
| dust pick up on hard floor ($dpu_{hf}$) | 5.2 | |
| dust re-emission | 5.11 | |
| sound power level | 6.15 | The reference to verification given in Annex ZZ of EN 60704-2-1:2015 shall not apply. |

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the products falling within the scope of this standard. 〈C〉

## 〈C〉 Annex ZZB
(informative)

### Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 666/2013 aimed to be covered

This European standard has been prepared under a Commission's standardisation request **'M/540' / 'C(2015) 8753 final'** to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners [OJEU L 192 of 13 July 2013].

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA Regulations.

**Table ZZB.1 – Correspondence between this European Standard and Commission Regulation (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners [OJEU L 192 of 13 July 2013] and Commission's standardisation request 'M/540' / 'C(2015) 8753 final'**

| Ecodesign requirements of Regulation No 666/2013 [OJEU L 192] | Clause(s) / sub-clause(s) of this EN | Remarks / Notes |
|---|---|---|
| annual energy consumption | 6.16 | |
| rated input power | | see list of harmonised standards (OJEU 2014/C 272/06)<br>EN 60335-2-2:2010/A11:2012<br>EN 60335-2-2:2010/A1:2013<br>IEC 60335-2-2:2009/A1:2012 |
| dust pick up on carpet ($dpu_c$) | 5.3 in conjunction with 6.Z1.2 | |
| dust pick up on hard floor ($dpu_{hf}$) | 5.2 | |
| dust re-emission | 5.11 | |
| sound power level | 6.15 | The reference to verification given in Annex ZZ of EN 60704-2-1:2015 shall not apply. |
| durability of hose | 6.9 | |
| operational motor lifetime | 6.Z17 | |

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