

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Washing machines for household use – Methods for measuring the performance

Machines à laver pour usage domestique – Méthodes de mesure de l'aptitude à la fonction



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
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INTERNATIONALE

ICS 97.060

ISBN 978-2-8327-0051-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**WASHING MACHINES FOR HOUSEHOLD USE –
METHODS FOR MEASURING THE PERFORMANCE**

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IEC 60456 has been prepared by subcommittee 59D: Performance of household and similar electrical laundry appliances, of IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This sixth edition cancels and replaces the fifth edition published in 2010 and its Amendment 1:2022. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Title changed from previous edition to more accurately describe application: "Washing machines for household use – Methods for measuring the performance".
- b) Separation of the test method results from the number of test runs in a test series, with the independence of each test run or test series, allowing different test classes to be evaluated.

- c) Introduction of a new standard powder detergent IEC-P, that substitutes the standard powder detergent IEC-A* by replacing sodium perborate with sodium percarbonate, for a better correlation with market offerings and in line with health/safety recommendations. Introduction of the new standard liquid detergents IEC-L and of the new wool standard detergent IEC-W with associated dosage instructions.
- d) Introduction of new measurement and evaluation methods for:
 - i) wool cleaning performance,
 - ii) LAS rinsing performance,
 - iii) gentleness of action,
 - iv) low power mode consumption,
 - v) temperature inside the washload,
 - vi) intermittently recurring functions,
 - vii) cold water washing machines,
 - viii) replacing washing performance by cleaning performance.
- e) Addition of alternative ambient conditions for conditioning of the test load with associated correction factors.
- f) Extension of the description of the washing machine loading, up to and beyond 25 kg of cotton test load, and introduction of a new mixed polyester-cotton load.
- g) Addition of the necessary definitions, measurement, and calculation methods for the evaluation of multi-compartment washing machines.
- h) Relocation of supplementary information to the IEC free-access supporting documents dashboard: reference machine maintenance information, test materials supplier information, expanded uncertainty values and any other pertinent information for the general public.

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

Draft	Report on voting
59D/518/FDIS	59D/525/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

Words in **bold** in the text are defined in Clause 3.

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

- reconfirmed,
- withdrawn, or
- revised.

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WASHING MACHINES FOR HOUSEHOLD USE – METHODS FOR MEASURING THE PERFORMANCE

1 Scope

This document specifies methods for measuring the performance of electric **washing machines** for household use, with or without heating devices, and utilising cold and/or hot water supply, including those which specify the use of no detergent for normal use. It is also applicable to **washing machines** for communal use in blocks of flats or in laundrettes and to electrical household appliances for both washing and drying textiles (household **washer-dryers**) with respect only to their washing related functions. It also deals with electrical appliances for water extraction by centrifugal force (**spin extractors**).

NOTE 1 Household **washer-dryer** combined performance is assessed to IEC 62512.

NOTE 2 Household tumble dryer performance is assessed to IEC 61121.

The object is to state and define the performance characteristics of household **washing machines**, the washing related functions of **washer-dryers** and water extraction function of **spin extractors**, and to describe the test methods for measuring these characteristics.

This document does not apply to **washing machines** for commercial use such as in commercial laundries.

NOTE 3 The preparation of methods for measuring the performance of **washing machines** for commercial use is under evaluation.

This document does not specify the acoustical noise measurement for household **washing machines**.

NOTE 4 Acoustical noise measurements and evaluation for household **washing machines** are specified in IEC 60704-1, IEC 60704-2-4 and IEC 60704-3.

This document is not intended to be used for the comparative evaluation of detergents.

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 60027-1:1992, *Letters symbols to be used in electrical technology – Part 1: General*

IEC 60335-2-7, *Household and similar electrical appliances – Safety – Part 2-7: Particular requirements for washing machines*

IEC 60734, *Household electrical appliances – Performance – Water for testing*

IEC 62301, *Household electrical appliances – Measurement of standby power*

IEC 63474, *Electrical and electronic household and office equipment – Measurement of networked standby power consumption of edge equipment*

ISO 139:2005, *Textiles – Standard atmospheres for conditioning and testing*
ISO 139:2005/AMD1:2011

ISO/CIE 11664-2, *Colorimetry – Part 2: CIE standard illuminants*

ISO 2060, *Textiles – Yarn from packages – Determination of linear density (mass per unit length) by the skein method*

ISO 2061, *Textiles – Determination of twist in yarns – Direct counting method*

ISO 3759, *Textiles – Preparation, marking and measuring of fabric specimens and garments in tests for determination of dimensional change*

ISO 7211-2, *Textiles – Woven fabrics – Construction – Methods of analysis – Part 2: Determination of number of threads per unit length*

ISO 80000-1:2022, *Quantities and units – Part 1: General*

EN ISO 648:2008, *Laboratory glassware – Single-volume pipettes*

EN 12127, *Textiles – Fabrics – Determination of mass per unit area using small samples*

CIE 015:2018, *Colorimetry*

ASTM E287-02:2019, *Standard Specification for Laboratory Glass Graduated Burets*

ASTM E288-10:2017, *Standard Specification for Laboratory Glass Volumetric Flasks*

ASTM E969-02:2012, *Standard Specification for Glass Volumetric (Transfer) Pipets*

3 Terms, definitions, abbreviated terms and symbols

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

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

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

Figure 1 shows the usage of and the relationships between definitions for performance and consumption measures.