

PUBLICLY AVAILABLE SPECIFICATION PRE-STANDARD



Clothes washing machines for commercial use – Methods for measuring the
performance

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IEC PAS 63125:2017

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 97.060

ISBN 978-2-8322-4520-0

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CLOTHES WASHING MACHINES FOR COMMERCIAL USE – METHODS FOR MEASURING THE PERFORMANCE

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The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
59D/448/DPAS	59D/452/RVDPAS

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CLOTHES WASHING MACHINES FOR COMMERCIAL USE – METHODS FOR MEASURING THE PERFORMANCE

1 Scope

This PAS specifies methods for measuring the performance of clothes **washing machines** for **commercial** use utilizing cold and/or hot water supplies and without heating or with heating devices for electricity, steam or gas. It also deals with appliances for both washing and drying textiles (**washer-dryers**) with respect to their washing-related functions. This PAS covers top, front and side-loaded non-household **washing machines** with horizontal or vertical axes and with one or more wash compartments.

NOTE 1 Non household tumble dryer performance is assessed to CLC/TS 50594.

The object is to state and define the principal performance characteristics of non-household **washing machines** and to describe the test methods for measuring these characteristics.

NOTE 2 This PAS does not apply to continuous batch **washing machines** (e.g. tunnel washers) or **washing machines** only possible to operate with automatic loading and unloading.

NOTE 3 This PAS does not specify safety requirements for **non-household washing machines**. Safety requirements are specified in EN 50571 and the EN ISO 10472 series.

2 Normative references (standards.iteh.ai)

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 60456, *Clothes washing machines for household use – Methods for measuring the performance*

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

EN 12953-10, *Shell boilers – Part 10: Requirements for feedwater and boiler water quality*

EN 50571, *Household and similar electrical appliances – Safety – Particular requirements for commercial electric washing machines*

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

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

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

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

EN ISO 11664-2, *Colorimetry – Part 2: CIE standard illuminants* (ISO 11664-2)

EN ISO 80000-1:2013, *Quantities and units – Part 1: General* (ISO 80000-1:2009 + Cor 1:2011)

DIN 53923, *Testing of textiles; determination of water absorption of textile fabrics*

CIE 015:2004¹, *Colorimetry* (3rd edition)

IAPWS-IF97, *IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam [International Association for the Properties of Water and Steam]*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions 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>

3.1.1

washing machine

appliance for cleaning and rinsing of textiles using water which may also have a means of extracting excess water from the textiles

3.1.2

test washing machine

washing machine that is subjected to part or all of the requirements in this PAS in order to determine its performance

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Note 1 to entry: **Test washing machine** may include **washing machines** according to 3.1.6, 3.1.7.

3.1.3

reference machine

specially constructed **washing machine** of known performance which is used to increase repeatability and reproducibility of results

Note 1 to entry: It may be used to provide a known performance level within a laboratory against which to compare selected performance parameters on **test washing machines** as defined in this PAS – refer to 5.5.2.

3.1.4

washer-dryer

washing machine which includes both a **spin extraction** function and also a means for drying the textiles, usually by heating and tumbling

Note 1 to entry: This PAS only covers the **operations** which relate to the **washing machine** function – see Clause 1.

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3.1.5

spin extractor

separate water-extracting appliance in which water is removed from textiles by centrifugal action (**spin extraction**)

3.1.6

vertical axis washing machine

washing machine in which the load is placed in a drum which rotates around an axis which is vertical or close to vertical

Note 1 to entry: For the purposes of this PAS, vertical axis is where the angle of the axis of rotation is more than 45° to horizontal. Where the drum does not rotate, the **washing machine** will be classified as a **vertical axis washing machine**.

Note 2 to entry: The classification of vertical axis or horizontal axis in this PAS is only used to define the placement of the load into the drum.

3.1.7

horizontal axis washing machine

washing machine in which the load is placed in a drum which rotates around an axis which is horizontal or close to horizontal

Note 1 to entry: For the purposes of this PAS, horizontal axis is where the angle of the axis is less than or equal to 45° to horizontal.

Note 2 to entry: The classification of vertical axis or horizontal axis in this PAS is only used to define the placement of the load into the drum.

3.1.8

automatic machine

washing machine where the load is fully treated by the machine without the need for user intervention at any point during the **programme** prior to its completion

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3.1.9

top loaded machine

washing machine where the load is placed in the wash compartment from the top, and which may be of a horizontal or vertical axis type

3.1.10

side loaded machine

washing machine where the load is placed in the wash compartment from the side, and which is of a horizontal axis type

3.1.11

pullman machine

washing machine where the wash compartment is divided in two compartments

3.1.12

Y-pocket machine

washing machine where the wash compartment is divided in three compartments

3.1.13

test run

single performance assessment as specified in Clause 8 of this PAS

3.1.14

test series

group of **test runs** on a **test washing machine** which, collectively, are used to assess the performance of a **washing machine**

3.1.15**operation**

each performance of a function that occurs during the **washing machine programme** such as pre-wash, washing, rinsing, draining or spinning

3.1.16**programme**

series of **operations** which are pre-defined within the **washing machine** and which are declared by the manufacturer as suitable for washing certain textile types

3.1.17**cycle**

complete washing process, as defined by the **programme** selected, consisting of a series of **operations** (wash, rinse, spin, etc.) and including any **operations** that occur after the completion of the **programme**

Note 1 to entry: Examples of **operations** that may occur after the completion of the **programme** are pumping, monitoring and anti-creasing (where applicable).

3.1.18**spin extraction**

water-extracting function by which water is removed from textiles by centrifugal action, which is included as a function (built in **operation**) of an **automatic washing machine** but may also be performed in a **spin extractor**

3.1.19**spin speed**

rotational frequency of a drum during **spin extraction**

Note 1 to entry: A method for determination of **spin speed** is not defined in this PAS.

3.1.20**base load**

unsoiled textiles used for testing

3.1.21**test load**

base load used for testing plus stain test strips

3.1.22**test load mass**

actual mass of the **base load** including stain test strips

3.1.23**nominal test load mass**

mass of dry textiles of a particular type for which the performance of the **test washing machine** shall be tested (**rated capacity** or part load)

Note 1 to entry: Target value for the conditioned **test load mass**.

3.1.24**rated capacity**

maximum mass in kilograms of dry textiles of a particular type which the manufacturer declares can be treated in the **washing machine** on the selected **programme**

3.1.25**programme time**

time from the initiation of the **programme** (excluding any user programmed delay) until the completion of the **programme**. If the **end of programme** is not indicated, the **programme time** is equal to the **cycle time**

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