

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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

(standards.iteh.ai)

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

IEC 60456:2010

<https://standards.iteh.ai/catalog/standards/sist/88385572-2516-443f-8b75-f862506bd87e/iec-60456-2010>



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2022 IEC, Geneva, Switzerland

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 from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat  
3, rue de Varembé  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### 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](http://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 It also gives information on projects, replaced and withdrawn publications.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](http://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](http://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](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Recherche de publications IEC - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



IEC 60456

Edition 5.1 2022-12  
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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

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

<https://standards.iteh.ai/catalog/standards/sist/88385572-2516-443f-8b75-f862506bd87e/iec-60456-2010>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 97.060

ISBN 978-2-8322-6310-5

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**



## REDLINE VERSION

## VERSION REDLINE



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

(standards.iteh.ai)

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

IEC 60456:2010

<https://standards.iteh.ai/catalog/standards/sist/88385572-2516-443f-8b75-f862506bd87e/iec-60456-2010>

## CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references .....	9
3 Terms, definitions and symbols .....	10
3.1 Terms and definitions .....	10
3.2 Symbols .....	13
3.2.1 Symbols relating to Subclause 9.2 – washing performance.....	13
3.2.2 Symbols relating to Subclause 9.3 – water extraction (spinning).....	14
3.2.3 Symbols relating to Subclause 9.4 – rinsing performance .....	14
3.2.4 Symbols relating to Subclause 9.5 – energy, water and time .....	14
3.2.5 Symbols relating to Clause 10 – wool shrinkage .....	14
3.2.6 Symbols relating to Annex G .....	15
3.2.7 Symbols relating to Annex I.....	15
3.2.8 Symbols relating to Annex L.....	15
4 Requirements.....	15
4.1 General.....	15
4.2 Rated capacity .....	16
4.3 Dimensions .....	16
5 Test conditions, materials, equipment and instrumentation.....	17
5.1 General.....	17
5.2 Ambient conditions .....	17
5.2.1 Electricity supply .....	17
5.2.2 Water supply .....	17
5.2.3 Ambient temperature and humidity .....	18
5.3 Test materials .....	19
5.3.1 General .....	19
5.3.2 Base loads .....	19
5.3.3 Stain test strips .....	19
5.3.4 Wool shrinkage specimens .....	20
5.3.5 Detergents.....	20
5.4 Equipment.....	20
5.4.1 General .....	20
5.4.2 Reference machine.....	21
5.4.3 Spectrophotometer .....	21
5.4.4 Equipment for conditioning the base load .....	22
5.4.5 Standard extractor.....	22
5.4.6 Iron for preparation of stain test strips after washing .....	23
5.4.7 Titration equipment.....	23
5.4.8 Other equipment.....	23
5.5 Instrumentation and accuracy.....	24
5.5.1 General .....	24
5.5.2 Instruments .....	24
5.5.3 Measurements.....	25
6 Preparation for testing.....	25
6.1 General.....	25
6.2 Test washing machine and reference machine preparation.....	25

6.2.1	Test washing machine .....	25
6.2.2	Reference machine .....	26
6.3	Detergent .....	26
6.3.1	General .....	26
6.3.2	Detergent dose .....	27
6.3.3	Mixing detergent .....	27
6.3.4	Detergent placement .....	27
6.4	Test loads .....	28
6.4.1	General .....	28
6.4.2	Pre-treatment of new base load items prior to use .....	30
6.4.3	Requirements regarding the age of base load items .....	30
6.4.4	Normalization of base load items before a new test series .....	31
6.4.5	Conditioning of base load items before a new test series .....	32
6.4.6	Test load composition .....	33
6.4.7	Addition of stain test strips or wool shrinkage specimens to the base load .....	36
7	Performance measurements – general requirements .....	37
8	Tests for performance .....	38
8.1	General .....	38
8.2	Test procedure for performance tests .....	38
8.2.1	Test conditions, materials and preparation for testing .....	38
8.2.2	Test load and loading .....	39
8.2.3	Programme .....	39
8.2.4	Test procedure .....	39
8.2.5	Test series .....	40
8.3	Measurements to determine washing performance .....	41
8.3.1	General .....	41
8.3.2	Removal and drying of stain test strips .....	42
8.3.3	Assessment of stain test strips .....	42
8.4	Measurements to determine water extraction performance .....	43
8.4.1	General .....	43
8.4.2	Washing machines .....	43
8.4.3	Spin extractors .....	43
8.5	Measurements to determine rinsing performance .....	43
8.5.1	General .....	43
8.5.2	Spin extraction and sampling .....	44
8.5.3	Alkalinity measurements .....	45
8.6	Measurements to determine water and energy consumption and programme time .....	46
8.6.1	General .....	46
8.6.2	Procedure .....	46
9	Assessment of performance .....	46
9.1	General .....	46
9.2	Evaluation of washing performance .....	47
9.3	Evaluation of water extraction performance .....	49
9.4	Evaluation of rinsing performance .....	49
9.4.1	General .....	49
9.4.2	Calculations .....	49
9.4.3	Evaluation .....	50

9.5	Evaluation of water and energy consumption and programme time .....	51
9.5.1	General .....	51
9.5.2	Water volumes .....	51
9.5.3	Programme time .....	51
9.5.4	Energy consumption .....	51
10	Shrinkage during the wool wash programme .....	52
10.1	General .....	52
10.2	Overview .....	52
10.2.1	General .....	52
10.2.2	Determination of reference shrinkage .....	53
10.3	Procedure .....	53
10.3.1	Preparation of wool shrinkage specimens .....	53
10.3.2	Wool programme test .....	55
10.3.3	Evaluation .....	56
11	Data to be reported .....	57
Annex A (normative)	Specification of stain test strips with standardized soiling .....	58
Annex B (normative)	Reference detergent A* .....	62
Annex C (normative)	Specifications for base loads .....	66
Annex D (normative)	Reference machine specification .....	69
Annex E (normative)	Reference machine programme definitions .....	74
Annex F (informative)	Reference programmes and examples of comparable washing machine programmes .....	77
Annex G (normative)	The bone-dry method of conditioning .....	78
Annex H (normative)	Folding and loading the test load .....	80
Annex I (normative)	Calculation of weighted average age of the cotton base load .....	97
Annex J (normative)	Loading a large standard extractor (rinsing performance) .....	99
Annex K (informative)	Laboratory internal testing guide .....	103
Annex L (normative)	Measurement of energy consumption in low power modes of washing machines .....	108
Annex M (normative)	Testing procedure for manual washing machines .....	111
Annex N (normative)	Procedure to determine test load size where rated capacity is not declared .....	113
Annex O (informative)	Additional evaluation of washing performance .....	115
Annex P (informative)	Testing deviations to reduce costs and their limitations .....	119
Annex Q (informative)	Uncertainty of measurements in IEC 60456 .....	125
Annex R (informative)	Environmental aspects of washing machine use determined in IEC 60456 .....	128
Annex S (normative)	Test report – data to be reported .....	131
Annex T (normative)	Wool shrinkage specimens .....	139
Annex U (informative)	Sources of materials and supplies .....	140
	Bibliography .....	141
	Figure 1 – Load item preparation prior to a test series .....	29
	Figure 2 – Load composition and age requirements .....	30
	Figure 3 – Attached test strip .....	37
	Figure 4 – Test series: process and decisions for load mass and age .....	41



Figure 5 – Positions for measuring soiled test pieces.....	42
Figure 6 – Wool shrinkage specimen, uncut.....	53
Figure 7 – Wool shrinkage specimen, fraying the edges and V-cuts.....	54
Figure 8 – Wool shrinkage specimen, marks.....	54
Figure H.1 – Folding towel with a stain test strip attached.....	80
Figure H.2 – Folding towel without a stain test strip attached.....	81
Figure H.3 – Folding pillowcases.....	81
Figure H.4 – Folding bed sheets.....	81
Figure H.5 – Folding pillowcases with a stain test strip attached.....	82
Figure H.6 – Folding pillowcases without a stain test strip attached.....	82
Figure H.7 – Folding shirts.....	83
Figure H.8 – Illustration of horizontal axis washing machine.....	83
Figure H.9 – Illustration of vertical axis washing machine.....	84
Figure H.10 – Horizontal axis washing machine: placement of items in the drum.....	85
Figure H.11 – Vertical axis washing machine: placement of items in the drum.....	85
Figure H.12 – Horizontal axis washing machine: illustration of alternating orientation.....	87
Figure H.13 – Placement of 2 towels with strips in one layer for load sizes larger than 10 kg.....	89
Figure H.14 – Vertical axis washing machines, four quadrants (plan view).....	92
Figure I.1 – Example for the exchange of load items for a 5 kg cotton load.....	98
Figure J.1 – Example of a large standard extractor.....	99
Figure J.2 – View from the top: loading the large standard extractor.....	99
Figure J.3 – Areas for loading.....	100
Figure J.4 – Folding of items.....	100
Figure J.5 – 3 areas of loading.....	101
Figure J.6 – Outer circle, with sheets.....	101
Figure J.7 – Outer circle, with sheets and pillow cases on top.....	101
Figure J.8 – Middle circle.....	102
Figure J.9 – Inner circle.....	102
Figure J.10 – Towels covering the load.....	102
Table 1 – Detergent dose.....	27
Table 2 – Number of items in the cotton test load for various test load masses.....	34
Table 3 – Number of items in the synthetics/blends test load for various test load masses.....	35
Table 4 – Number of items in the wool programme test load for various test load masses.....	36
Table A.1 – Ratios and tolerances of standardized soils, Reference Machine CLS and MP Lab.....	61
Table B.1 – Composition of the reference detergent A*.....	62
Table B.2 – composition of the standard powder detergent (IEC-P).....	64
Table C.1 – Specification of the cotton base load items.....	66
Table C.2 – Specification of the synthetics/blends base load items.....	67
Table D.1 – Description of the reference washing machine and method of use type 1.....	70

Table D.2 – Description of the reference washing machine and method of use type 2.....	72
Table D.3 – Programmed volume for type 2 reference machine .....	73
Table E.1 – Specification of reference washing programmes.....	75
Table E.2 – Tolerances given for some procedure parameters .....	76
Table F.1 – Reference programmes and examples of comparable washing machine programmes.....	77
Table H.1 – Vertical axis washing machines, loading sequence example for a synthetics/blends load .....	86
Table H.2 – Horizontal axis washing machines, loading sequence .....	88
Table H.3 – Horizontal axis washing machine, loading example (5 kg).....	90
Table H.4 – Vertical axis washing machines, small loads without sheets (1,0 kg to 2,5 kg) .....	92
Table H.5 – Vertical axis washing machines, medium loads with two sheets (3,0 kg to 7,0 kg) .....	93
Table H.6 – Vertical axis washing machines, large loads with three sheets (7,5 kg to 8,5 kg) .....	94
Table H.7 – Vertical axis washing machines, very large loads with four sheets (9,0 kg to 10,0 kg) .....	95
Table H.8 – Vertical axis washing machine – loading example (5 kg).....	96
Table S.1 – Data for test washing machine .....	131
Table S.2 – Data, parameters and performance results, cotton or synthetics/blends base loads .....	133
Table S.2a – Data, parameters and results, cotton or synthetics/blends base loads .....	133
Table S.2b – Performance results, cotton or synthetics/blends base loads.....	134
Table S.3 – Data, parameters and results – wool shrinkage – polyester base load.....	135
Table S.4 – Weighted average age – cotton load .....	136
Table S.5 – Materials .....	137
Table S.6 – Equipment .....	138

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

### CLOTHES WASHING MACHINES FOR HOUSEHOLD 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 dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) 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.

**This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.**

**IEC 60456 edition 5.1 contains the fifth edition (2010-02) [documents 59D/358/FDIS and 59D/360/RVD], its corrigendum (2011-09) and its amendment 1 (2022-12) [documents 59D/486/CDV and 59D/496/RVC].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**

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

This fifth edition constitutes a technical revision.

Experience with the use of the fourth edition of IEC 60456, together with some revised test conditions and the need for a more globally applicable standard, are the main reasons for this fifth edition.

This edition includes the following significant technical changes from the previous edition.

- Modified test load mass requirement for cases where rated capacity of test machine is not declared. Test load mass determination in case rated capacity is not declared was changed to remove the ambiguity in edition 4 and to encourage declaration.
- Introduction of soft water option.
- Expanded stain/soil set (for assessment of washing performance).
- Improved method of loading and folding test load items to better suit vertical axis, horizontal axis and twin tub systems.
- Revised and amended reference machine specification reflecting full qualification of new Electrolux Wascator CLS.
- New reference programmes for lower temperatures and vertical axis systems. New informative annex comparing reference programmes to typical household programmes.
- Refined rinsing efficiency method.
- Introduction of low power modes "Off" and "Left On" (for assessment of energy consumption).
- New annex about uncertainty of measurements.

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

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

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under [webstore.iec.ch](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.

**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.**

## CLOTHES WASHING MACHINES FOR HOUSEHOLD USE – METHODS FOR MEASURING THE PERFORMANCE

### 1 Scope

This International Standard specifies methods for measuring the performance of clothes **washing machines** for household use, with or without heating devices utilising cold and/or hot water supply. It also deals with appliances for water extraction by centrifugal force (**spin extractors**) and is applicable to appliances for both washing and drying textiles (**washer-dryers**) with respect to their washing related functions. This International Standard also covers **washing machines** which specify the use of no detergent for normal use.

NOTE 1 Tumble dryer performance is assessed to IEC 61121.

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

NOTE 2 This international standard applies also to **washing machines** for communal use in blocks of flats or in launderettes. It does not apply to **washing machines** for commercial laundries. This International Standard is not intended to be used for the comparative evaluation of detergents.

NOTE 3 This International Standard does not specify acoustical noise requirements for **washing machines**. Acoustical noise measurements are specified in IEC 60704-1 and IEC 60704-2-4.

NOTE 4 This International Standard does not specify safety requirements for **washing machines**. Safety requirements are specified in IEC 60335-2-7.

### 2 Normative references

The following referenced documents are indispensable for the application 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 60335-2-7, *Household and similar electrical appliances – Safety – Part 2-7: Particular requirements for washing machines*

IEC 60734, *Household electrical appliances – Performance – Hard water for testing*

IEC 62053-21, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)*

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

IEC Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

ISO 31-0:1992, *Quantities and units – Part 0: General principles*

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

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

### 3 Terms, definitions and symbols

#### 3.1 Terms and definitions

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

##### 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 document in order to determine its performance

NOTE **Test washing machine** may include washing machines according to 3.1.7, 3.1.8, 3.1.9 and/or 3.1.10.

##### 3.1.3

###### **reference machine**

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

NOTE 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 document – refer 5.4.2.

##### 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 This document only covers the operations which relate to the **washing machine** function – see Scope.

##### 3.1.5

###### **spin extractor**

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

##### 3.1.6

###### **standard extractor**

spin extractor used to remove water remaining in the base load at the completion of the programme where a rinse performance measurement is required

##### 3.1.7

###### **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. For the purposes of this document, vertical axis is where the angle of the axis of rotation is more than 45 degrees to horizontal. Where the drum does not rotate, the washing machine shall be classified as a vertical axis washing machine.

NOTE The classification of vertical axis or horizontal axis in this document is only used to define the placement of the load into the drum.

##### 3.1.8

###### **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. For the purposes of this document, horizontal axis is where the angle of the axis is less than or equal to 45 degrees to horizontal.

NOTE The classification of vertical axis or horizontal axis in this document is only used to define the placement of the load into the drum.

### 3.1.9

#### **manual washing machine**

**washing machine** where the machine requires user intervention at one or more points during the programme to enable the machine to proceed to the next **operation**

NOTE Examples of user intervention could include manual fill (non automatic water level), transfer of the load between a washing drum and a **spin extractor** drum or manual draining. **Manual washing machines** have special requirements regarding the **programme** which is tested for this document; see Annex M.

### 3.1.10

#### **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

### 3.1.11

#### **test run**

single performance assessment as specified in Clause 7 of this document

### 3.1.12

#### **test series**

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

### 3.1.13

#### **operation**

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

### 3.1.14

#### **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

### 3.1.15

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

### 3.1.16

#### **spin extraction**

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

### 3.1.17

#### **spin speed**

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

NOTE A method for determination of **spin speed** is not defined in this standard.

### 3.1.18

#### **base load**

textile load used for testing without stain test strips or wool shrinkage specimens