SLOVENSKI STANDARD
SIST EN 60456:2001

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Clothes washing machines for household use - Methods for measuring the performance

Clothes washing machines for household use - Methods for measuring the performance

Waschmaschinen für den Hausgebrauch - Verfahren zur Messung der Gebrauchseigenschaften

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

Ta slovenski standard je istoveten z: **EN 60456:1999**

ICS:

97.060 Aparati za nego perila Laundry appliances

SIST EN 60456:2001 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 60456

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Supersedes EN 60456:1994 and its amendments

English version

Clothes washing machines for household use Methods for measuring the performance (IEC 60456:1998, modified)

Machines à laver le linge pour usage domestique - Méthodes de mesure de l'aptitude à la fonction (CEI 60456:1998, modifiée)

Waschmaschinen für den Hausgebrauch Verfahren zur Messung der Gebrauchseigenschaften (IEC 60456:1998, modifiziert)

This European Standard was approved by CENELEC on 1999-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 60456:1999 E

Foreword

The text of the International Standard IEC 60456:1998, prepared by SC 59D, Home laundry appliances, of IEC TC 59, Performance of household electrical appliances, together with common modifications prepared by the Technical Committee CENELEC TC 59X, Consumer information related to household electrical appliances, was submitted to the formal vote and was approved by CENELEC as EN 60456 on 1999-05-01.

This European Standard supersedes EN 60456:1994 and its amendments.

Significant technical differences are:

a) Agitator and impeller washing machines have been included.

b) Tolerance limits have been specified for instrumentation, base loads and detergent.

c) Instrumentation of measuring optical reflectance has been specified.

d) The temperature of hot water supply has been raised from (55 ± 2) °C to (60 ±2) °C.

e) A formula to calculate the energy consumption of washing machines without heating elements or with cold and hot water supply has been introduced (see common modifications).

f) The tolerances for the declaration of the washing performance are changed.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	1999-10-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	1999-10-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A, B, C and ZA are normative and annexes D, E, F and G are informative.
ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC60456:1998 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

1 Scope

Add a fourth paragraph:

This European Standard also specifies, as far as necessary, the test methods which shall be applied in accordance with the Commission's Directive 95/12/EC of 23 May 1995 implementing Council Directive 92/75/EEC with regard to energy labelling of household washing machines. It adds a subclause which specifies the determination of the energy consumption of washing machines without heating elements and clauses defining permitted tolerances to values declared by the manufacturer and control procedures for checking these declared values.

2 Normative references

Add the following references:

IEC 60704-2-4	: 1989	*Test code for the determination of airborne acoustical noise emitted by household and similar electrical appliances - - Part 2: Particular requirements for washing machines and spin extractors*
IEC 60704-3	: 1992	*Test code for the determination of airborne acoustical noise emitted by household and similar electrical appliances - - Part 3: Procedure for determining and verifying declared noise emission values*

3.12 rated capacity

Add a second paragraph:

For measuring the performance of washing machines according to this standard the rated capacity shall correspond with the test load. The test load comprises the base load specified in 7.1 and the test strips specified in 7.3.

6 General conditions for measurements

6.1 General

Add a second sentence:

For the purpose of energy labelling according to the Commission Directive mentioned in clause 1, Scope, the 60 °C cotton programme shall be used without pre-wash in accordance with the manufacturers instruction.

6.2.1 Electrical supply

Replace the existing text by:

The supply voltage shall be maintained at 230 V ± 1%.
The supply frequency shall be 50 Hz ± 1%.

6.2.2 Water supply

Add a new paragraph:

When carrying out measurements to determine values to be declared for the 60 °C cotton cycle according to the Commission Directive on energy labelling the temperature of the water supply shall be (15 ± 2) °C.
For appliances without heating elements hot water is permitted to be used and the temperature shall be reported.

6.3 Reference washing machine

Add a second paragraph:

At each run it shall be checked that no detergent remained in the detergent dispenser.

7.2.1 Preparation of textiles

Add at the end of the first sentence of the second paragraph:

... and ironed (to avoid wrinkles).

7.4 Detergent

7.4.1 General

Add after the first sentence:

When carrying out measurements to determine the performance of washing machines according to the Commission's Directive only detergent A shall be used.

8.4 Water temperature

Replace the existing paragraph by:

The temperature measuring device shall have a resolution of at least 0,2 K and an accuracy of ± 1 K including non-linearity error, in the temperature range 0 °C to 60 °C.

8.8 Electrical energy

Replace the existing paragraph by:

The measurement shall have an accuracy that provides less than 2 % inaccuracy of the highest nominal value according to rated power input data specified by the manufacturer.

9 Washing performance

9.3.1 General

Add after the existing paragraph:

The load shall evenly be distributed from the bottom of the drum to the top.

9.3.4 Test

Add after the first sentence:

... for normal soiled clothes.

Replace the first sentence of the second paragraph by:

Parallel to each test cycle of the washing machine a cycle is performed on the reference washing machine (always with a 5 kg load according to table A.2) under the same conditions with a reference programme cotton 60 °C (according to tables B.4 or B.5).

Add after the second paragraph:

If a detergent dispenser is incorporated in the washing machine the detergent shall exclusively be filled into the dispenser in accordance with the manufacturer's instructions, if any, for normal use. If some detergent remained in the dispenser the dispenser shall be cleaned before the next run.

12 Water and energy consumption and programme time

Add a new subclause:

12.101 Energy consumption for machines without heating elements

12.101.1 Procedure

The procedure is the same as described in 12.2 including the NOTE.

The temperature and the volumes of cold and hot water used during the cycle are measured separately.

For the purpose of measuring the energy, machines without heating elements should be loaded before the addition of water.

NOTE - It is common practice to put water into the agitator machines before the addition of the load.

12.101.2 Evaluation

The arithmetic mean of the measured values is calculated.

The water volumes, program duration and energy consumption are expressed and rounded according to 12.3.

The total energy consumption E_T of washing machines having no heating elements or with cold and hot water supply is the energy consumption measured during the cycle E_c plus the calculated energy E_h needed to heat the hot water used during the cycle. Cold water supply energy corrections shall not be calculated.

$$E_T = E_c + E_h$$

$$E_h = \frac{V_h \times (t_h - 15)}{860}$$

where:

V_h is the volume of hot water in litres used during the cycle;
t_h is the temperature of the hot water entering the appliance being tested;
1/860 is the energy equivalent.

Add the following new clauses:

101 Determination of the maximum spin speed

The maximum spin speed shall be measured with the appliance loaded with the rated capacity as declared by the manufacturer for cotton.

The maximum spin speed shall be determined for the 60 °C cotton cycle during the highest spin speed variation which is continuously reached during a period of 60 s. The maximum spin speed is the lowest speed measured during this period.

102 Determination of airborne acoustical noise

The airborne acoustical noise according to this European Standard shall be measured according to EN 60704-2-4 and determined and verified according to EN 60704-3. The same 60 °C program as specified in 6.1 shall be used.

For the purpose of energy labelling as required according to the Commission Directive mentioned in clause 1, the noise emission shall be measured separately for washing and spinning cycle.

103 Tolerances and control procedures

103.1 Energy consumption

The energy consumption measured according to clause 12 shall not be greater than the value declared by the manufacturer plus 15%.

If the result of the test carried out on the first appliances is greater than the declared value plus 15%, the test shall be carried out on a further three appliances.

The arithmetic mean of the values of these three appliances shall not be greater than the declared value plus 10%.

103.2 Water consumption

The water consumption measured according to clause 12 shall not be greater than the value declared by the manufacturer plus 15%.

If the result of the test carried out on the first appliances is greater than the declared value plus 15%, the test shall be carried out on a further three appliances.

The arithmetic mean of the values of these three appliances shall not be greater than the declared value plus 10%.

103.3 Spin speed

The spin speed, determined according to clause 101, shall not be less than the value declared by the manufacturer minus 10% or minus 100 rpm, whichever is the smaller value.

If the result of the test carried out on the first appliances is less than the declared value minus 10% or minus 100 rpm (whichever is the smaller value), the test shall be carried out on a further three appliances.

The value of each of these three appliances shall not be less than the declared value minus 10% or minus 100 rpm, whichever is the smaller value.

103.4 Spin extraction

The value of the spin extraction measured according to clause 11 shall not be higher than the value declared by the manufacturer plus 15%.

If the result of the test carried out on the first appliances is higher than the declared value plus 15%, the test shall be carried out on a further three appliances.

The arithmetic mean of the values of these three appliances shall not be higher than the declared value plus 10%.

103.5 Washing performance

The washing performance, determined according to clause 9, shall not be less than the value declared by the manufacturer minus 0,03.

If the result of the test carried out on the first appliance is less than the declared value minus 0,03, the test shall be carried out on a further three appliances.

The arithmetic mean of the values of these three appliances shall not be less than the declared value minus 0,02.

103.6 Program duration

The program duration measured according to clause 12 shall not be longer than the value declared by the manufacturer plus 15 %.

If the result of the test carried out on the first appliances is longer than the declared value plus 15%, the test shall be carried out on a further three appliances.

The arithmetic mean of the values of these three appliances shall not be longer than the declared value plus 10%.

103.7 Rinsing efficiency

Under consideration.

Annex C

Replace (informative) by (normative).

Annex G

Add the following notes for the standards indicated:

IEC 60704-1 NOTE: Harmonized as EN 60704-1:1997 (not modified).

IEC 60704-2-4 NOTE: Harmonized as EN 60704-2-4:1994 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60704-2-4	1989	Test code for the determination of airborne acoustical noise emitted by household and similar electrical appliances Part 2: Particular requirements for washing machines and spin extractors	EN 60704-2-4	1994
IEC 60704-3	1992	Part 3: Procedure for determining and verifying declared noise emission values	EN 60704-3	1994
IEC 60734	1993	Hard water to be used for testing the performance of some household electrical appliances	EN 60734	1993
ISO 3801	1977	Textiles - Woven fabrics - Determination of mass per unit length and mass per unit area	-	-
ISO 4319	1977	Surface active agents - Detergents for washing fabrics - Guide for comparative testing of performance	-	-
ISO 7211-2	1984	Textiles - Woven fabrics - Construction Methods of analysis Part 2: Determination of number of threads per unit length	-	-

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

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For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

This third edition cancels and replaces the second edition published in 1994 and constitutes a complete revision.

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

FDIS	Report on voting
59D/126/FDIS	59D/133/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.

Annexes A and B form an integral part of this standard.

Annexes C, D, E, F and G are for information only.

In this standard, the following print types are used:

- *test specifications*: *in italic type;*
- notes: in small roman type;
- other text: in roman type.
- words in **bold** in the text are defined in clause 3.