



SLOVENSKI STANDARD

SIST EN 60335-2-7:1995

01-marec-1995

Safety of household and similar electrical appliances - Part 2: Particular requirements for washing machines (IEC 335-2-7:1984, modified)

Safety of household and similar electrical appliances -- Part 2: Particular requirements for washing machines

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke -- Teil 2: Besondere Anforderungen für Waschmaschinen

Sécurité des appareils électrodomestiques et analogues -- Partie 2: Règles particulières pour les machines à laver le linge

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Ta slovenski standard je istoveten z: EN 60335-2-7:1990/A51:1992

ICS:

13.120	Varnost na domu	Domestic safety
97.060	Aparati za nego perila	Laundry appliances

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en

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EUROPEAN STANDARD
NORME EUROPEENNE
EUROPAISCHE NORM

EN 60 335-2-7

April 1990

UDC 621.365:64-621-83:64:614.8.004.1-
777:621.396.669.8

Supersedes HD 256 S2:1984

Descriptors: Household electrical appliance, washing machine, protection against electric shock, protection against fire risk, protection against mechanical hazard

English version

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES
PART 2: PARTICULAR REQUIREMENTS FOR WASHING MACHINES
(IEC 335-2-7:1984, modified)

Sécurité des appareils
électrodomestiques
et analogues
Deuxième partie:
Règles particulières pour
les machines à laver le linge
(CEI 335-2-7:1984, modifiée)

Sicherheit elektrischer
Geräte für den Hausgebrauch
und ähnliche Zwecke
Teil 2:
Besondere Anforderungen für
Waschmaschinen
(IEC 335-2-7:1984, modifiziert)

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This European Standard was approved by CENELEC on 12 June 1989. 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.

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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, 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 Bréderode 2, B - 1000 Brussels

BRIEF HISTORY

The proposal to endorse the third edition of IEC Publication 335-2-7, document CENELEC/TC 61 (SEC) 453, was circulated under the enquiry procedure in September 1985.

This proposal was discussed during the Zandvoort meeting in June 1986 when it was decided to submit a draft for EN 60335-2-7 to the voting procedure. This procedure started in December 1988.

The text of this draft was ratified by the CENELEC Technical Board on the 12th of June 1989.

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FOREWORD

R This European Standard has been prepared by the Secretariat of CENELEC Technical Committee 61.

The following dates are applicable:

- date of announcement (doa) 1989-12-01
- date of latest publication (dop) 1990-03-01
- date of withdrawal of conflicting national standards (dow) 1991-03-01

This European Standard replaces HD 256 S2:1984.

For products which have complied with HD 256 S2:1984 before 1991-03-01, as shown by the manufacturer or by a Certification Body, this previous standard may continue to apply for production until 1996-03-01.

This document supplements or modifies the corresponding clauses of IEC 335-2-7:1984 so as to convert that standard into the European Standard EN 60335-2-7.

This standard has to be used in conjunction with EN 60335-1:1988, Safety of household and similar electrical appliances, Part 1: General requirements.

Where a particular sub-clause of Part 1 is not mentioned in this Part 2, that sub-clause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirement, test specification or explanatory matter in Part 1 is to be adapted accordingly.

Sub-clauses and figures which are in addition to those in IEC 335-1 are numbered starting with 101. Additional appendices are lettered AA, BB, etc. Sub-clauses which are in addition to those in IEC 335-2-7 are numbered starting with 601. Additional annexes are lettered ZAA, ZBB, etc.

Special national conditions (snc) causing a deviation from this European Standard are listed in Annex ZX and are in addition to those in EN 60335-1.

There are no national deviations from this European Standard, other than those listed in Annex ZY of EN 60335-1.

Other publications quoted in this standard:

- EN 60335-2-4: Particular requirements for spin extractors.
- EN 60335-2-11: Particular requirements for tumbler dryers.
- HD 274: Requirements for the connection of washing machines and dishwashers to the water supply mains.
- ISO 1817: Rubber, vulcanized - Determination of the effect of liquids.
- ISO 4046: Paper, board, pulp and related terms - Vocabulary.

Note. Where reference is made to other harmonized standards, the latest edition of that standard is applicable.

- r The following print types are used:
- R - requirements proper: in roman type (indicated in this document in the margin by R);
 - i - test specifications: in italic type (indicated in this document in the margin by i);
 - r - explanatory matter: in smaller roman type (indicated in this document in the margin by r).

Instructions for modification of the reference document are in italic type and are indicated in this document in the margin by i.

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ENDORSEMENT NOTICE

R IEC 335-2-7:1984 applies, taking into account the following common modifications.

COMMON MODIFICATIONS

i Foreword Delete.

Preface Delete.

1. SCOPE

i 1.1 Replace "IEC Publication 335-2-4" by "EN 60335-2-4" and "IEC Publication 335-2-11" by "EN 60335-2-11".

7. MARKING

i 7.1 Replace the first explanation by:

r Washing machines have to be marked with the symbol for splash-proof construction.

i Add:

r Refer **inc.** <https://standards.iteh.ai/catalog/standards/sist/5f49bb73-4edc-46f3-9620-44eb75af9996/sist-en-60335-2-7-1995>

i 7.10 Delete.

19. ABNORMAL OPERATION

i 19.6 Delete the explanation referring to Appendix D.

19.101 Add to the examples of fault conditions:

r - failure or blocking of the mechanical part of a water level switch;
- puncture of the capillary tube of a thermostat.

i After the second paragraph of the explanations, add:

r Malfunctioning of components is restricted to those cases where a defect of the component might entail a hazard to the user or the environment.

COMMON MODIFICATIONS

- i Delete the first sentence of the fifth paragraph of the explanations and start the second sentence as follows:
- r Locking in the "on" position
- i Delete the sixth paragraph of the explanations, which deals with water level switches.

22. CONSTRUCTION

- i 22.2 Replace the requirement by:
- R Washing machines shall be splash proof.
- i Add:

- 22.11 Modification:
Instead of the test specification, the following applies:

Compliance is checked by inspection and by the following tests, which are carried out in the order given.

The washing machine is operated under the conditions specified in Clause 11, except that it is subjected three times in succession to the sequence of operation described for normal load, that the quantity of textile material is 0.5 times the quantity specified and that detergent as specified in Appendix BB is added.

The hardness of the water to be used for these tests is between 25 and 75 ppm calcium carbonate (CaCO_3).

The quantity of detergent to be added to the water is equal to 1.5 times the quantity specified in the instruction sheet for normally soiled washing when using hard water. In the absence of such instructions, the following quantity is added:

- for washing machines of the pulsator or agitator type ... 5 g per litre of water,
- for washing machines of the drum type:
 - . without pre-washing 40 g per kilogramme of textile material
 - . with pre-washing:
 - for the pre-wash 25 g per kilogramme of textile material and
 - for the main wash 30 g per kilogramme of textile material.

- r The quantity of detergent specified for washing machines of the drum type is based on the quantity of textile material specified for normal load.
If the use of high-foaming detergent is recommended in the instruction sheet, commercial high-foaming detergent is used.

COMMON MODIFICATIONS

- i If obstruction of detergent dispenser outlets into the container is likely to occur in normal use, the washing machine is operated with the outlets blocked one at a time. The dispenser is filled with detergent and water having the above specified hardness is then supplied to the washing machine for a period of 15 s. The water pressure is 0.5 MPa (5 bar). Drops of liquid are applied by means of a syringe to those parts inside the washing machine where leakage could occur and affect the electrical insulation. The liquid is composed of 5 g of the detergent as specified in Appendix BB in 1 litre of distilled water.
The washing machine is in operation or at rest, whichever is the more unfavourable.
After this test, inspection shall show that there is no trace of liquid or detergent on windings or insulation where tracking could occur.
- r Examples of parts where leakage could occur are couplings, seals and hoses.
Parts which withstand the ageing test specified in Annex ZAA are not considered to be parts where leakage could occur.
- i 22.15 Replacement:
R Materials which burn fiercely, such as celluloid, shall not be used in the construction of appliances.
Insulating material used for switching devices, such as switches, thermostats and other control devices, shall be resistant to fire.
This requirement does not apply to thermal cut-outs and overload releases.
- i Compliance is checked by inspection, by a burning test if necessary and, for the resistance to fire, by the following test.
A gas flame is applied to the outside of a separate sample of the switching device, which is suspended in still air. The gas flame is applied to the most unfavourable place where a flame may be expected, the gas flame being applied each time to the same place.
The flame has a length of 12 ± 2 mm and is obtained by burning butane gas from a hypodermic needle having a bore of 0.5 ± 0.1 mm. Initially, the flame is applied for 1 min and is then removed.
If no self-sustaining flame occurs, the flame is immediately applied for a further period of 1 min and is then removed.
If again no self-sustaining flame occurs, the flame is immediately applied once more for a period of 2 min and is then removed.

COMMON MODIFICATIONS

- i If again no self-sustaining flame occurs, the sample is considered to have withstood the test, provided that during the test no burning drops or glowing particles have fallen from the sample.
If a self-sustaining flame occurs or if burning drops or glowing particles have fallen from the sample and if the switching device is normally mounted in a separate casing within the washing machine, the test procedure is repeated, the flame being, however, applied to the interior of the casing.
If no separate casing is provided or if the casing shows self-sustaining flames or if burning drops or glowing particles have fallen from the casing, the test procedure is repeated on the switching device mounted in the washing machine, the latter being placed on a piece of white pine-wood board covered with tissue paper.
During this test, flames, burning drops or glowing particles shall not spread fire to other parts of the washing machine or to its surroundings.
Any flame shall extinguish within 30 s and there shall be no burning of the tissue paper or scorching of the board.
- r Places where a flame may be expected are those where there is a risk of the formation of a tracking path, for example due to the deposition of detergent, moisture or conductive material emanating from contacts and the like.
The hypodermic needle may be bent in order to reach places where a flame may be expected.
A separate casing is considered as a means to prevent propagation of fire to other parts of the washing machine or to its surroundings; it may contain one or more switching devices. In order to make it possible to apply the flame inside the washing machine, it may be necessary to cut away a part of it, care being taken that this does not influence the result of the test.
Tissue paper is specified in Clause 6.86 of ISO Standard 4046-1978 as thin, soft and strong lightweight paper generally intended for packing delicate articles, its substance being between 12 g/m² and 30 g/m².
This test is not made on switching devices carrying a current less than 1 A under normal conditions of use or on insulating material withstanding a tracking test as specified in Sub-clause 30.3, with the supply voltage increased to 250 V.

- i 22.103 Delete.

COMMON MODIFICATIONS

24. **COMPONENTS**
- i Add:
- R 24.601 Components necessary for the connection of the washing machine to the water supply mains shall be delivered together with the washing machine; these components shall be suitable for their purpose.
- i Compliance is checked by inspection and by the appropriate tests specified in HD 274.
30. **RESISTANCE TO HEAT, FIRE AND TRACKING**
- i Replace the text by:
- R This clause of Part 1 is applicable except as follows:
- i 30.2 Addition:
- r The hot-mandrel test is not made on parts of insulating material used for switching devices, such as switches, thermostats and other control devices, except thermal cut-outs and overload releases; for such parts the tests of Sub-clause 22.15 are considered to be adequate.
- i 30.3 Modification: [SIST EN 60335-2-7:1995](https://standards.iteh.ai/catalog/standards/sist/5f19bb73-1dc-46f3-9620-44eb75af9996/sist-en-60335-2-7-1995)
- R Instead of the requirement, the following applies:
Supplementary insulation of metal-encased Class II washing machines and insulating parts retaining live parts in position, shall be of material resistant to tracking.
- i Appendices Replace the text of Appendix A to Appendix G by:
- R The appendices of Part 1 are applicable.
- i Appendix AA Delete.
- Appendix BB Replace the first two lines after the title by:
- R The standard detergent to be used for the spillage test and for the tests of Sub-clause 22.11 has the following composition in parts by mass:
-

ANNEX ZAA

AGEING TEST FOR ELASTOMERIC PARTS

- i The ageing test on elastomeric parts is carried out by measuring their hardness and mass before and after immersion in a solution of detergent at elevated temperature.
The test is carried out on at least three samples of each part. The samples and test procedure are as specified in ISO Standard 1817-1985, taking into account the following clauses modified as specified.

3. Test liquid

- i The test liquid is obtained by dissolving 5 g of the detergent specified in Appendix BB in each litre of distilled water.

- r Care is taken to ensure that the total mass of the test pieces immersed does not exceed 100 g for each litre of solution, that the test pieces are completely immersed and that their whole surface is freely exposed to the solution. During the tests, the test pieces are not to be exposed to direct sunlight.
Test pieces of different compounds are not to be immersed at the same time in the same solution.

5. Conditioning of test pieces

- i The temperature is 23 ± 2 °C and the relative humidity is 50 ± 5 %.

6. Temperature of immersion

- i The solution is heated, within 1 h, with the test pieces immersed, from ambient temperature to 97 ± 3 °C and maintained at this temperature. The solution is renewed every 24 h and heated in the same way.
- r To avoid undue evaporation of the solution, it is recommended to use a closed-circuit system or similar method for renewing the solution.

7. Period of immersion

- i The test pieces are immersed for a total period of $96 \pm \frac{2}{0}$ h. The test pieces are then immediately immersed in a fresh solution which is maintained at ambient temperature. The pieces are immersed for 45 ± 15 min.
After having been removed from the last solution, the test pieces are rinsed in cold water at 15 ± 5 °C and then dried with blotting paper.

8. Determination of change in volume, change in mass or change in dimensions

i 8.1 General

The gravimetric method applies.

8.2 Volumetric and gravimetric methods

8.2.4 Expression of results

The increase in mass of the test pieces shall not exceed 10% of the value determined before immersion.

10. Determination of change in physical properties after immersion

i The micro hardness test of Sub-clause 10.2 applies.

10.2.5 Expression of results

The hardness of the test pieces shall not have changed by more than 8 IRHD. Their surfaces shall not have become sticky and shall show no crack visible to the naked eye or any other deterioration.

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ANNEX ZX (normative)

SPECIAL NATIONAL CONDITIONS

R The following special national conditions, which are in addition to those in EN 60335-1, exist in the countries mentioned.

7.1 DENMARK

Washing machines of Class I shall be marked with the following text:
Skal ekstrabeskyttes, jf. stærkstrømsregl.

r Shall be protected against indirect contact, see Heavy Current Regulations.

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EUROPEAN STANDARD
NORME EUROPEENNE
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EN 60335-2-7/A1

October 1990

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Descriptors: Household electrical appliance, washing machine, protection against electric shock, protection against fire risk, protection against mechanical hazard

Amendment A1 to the English version of EN 60335-2-7

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES
PART 2: PARTICULAR REQUIREMENTS FOR WASHING MACHINES
(Amendment 1:1988 to IEC 335-2-7:1984, modified)

Sécurité des appareils
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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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