

**Household and similar electrical appliances – Safety –
Part 2-5: Particular requirements for dishwashers**

CORRIGENDUM 1

Page 6

2 Normative references

Add:

IEC 60436, *Methods for measuring the performance of electric dishwashers*

Replace "ISO 1817:1985" by "ISO 1817:1999".

Delete:

ISO 4046, *Paper, board, pulp and related terms – Vocabulary*

Page 11

17 Overload protection of transformers and associated circuits

Instead of:

"This clause of Part 1 is not applicable."

read

"This clause of Part 1 is applicable."

18 Endurance

Instead of:

"This clause of Part 1 is applicable except as follows."

read

"This clause of Part 1 is applicable."

19 Abnormal operation

19.101 *Delete the word "and" after "normal operation" in the first sentence.*

Page 19

Bibliography

Add:

ISO 3864, *Safety colours and safety signs*

ISO 4046, *Paper, board, pulp and related terms – Vocabulary*

Delete:

IEC 60436, *Methods of measuring the performance of electric dishwashers*

IEC 61770, *Electric appliances connected to the water mains – Avoidance of backsiphonage and failure of hose sets*

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Household and similar electrical appliances – Safety –

Part 2-5: Particular requirements for dishwashers

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-5:
Règles particulières pour les lave-vaisselle*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –

Part 2-5: Particular requirements for dishwashers

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 specifications, 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.

This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This fifth edition cancels and replaces the fourth edition published in 1992 and its amendments 1 (1999) and 2 (1999). It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on Voting
61/2099/FDIS	61/2130/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.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for electric dishwashers.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and associated noun are also in bold.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

The following differences exist in the countries indicated below.

- 6.1: Appliances may be of class 0I, if the rated voltage does not exceed 150 V (Japan).
- 20.102: A 30 000 cycle endurance test is carried out on door interlocks (USA).
- 25.7: The supply cord is required to have a free length of at least 1,5 m (USA).
- Annex AA: The detergent and rinsing agent are different (USA).
- Annex BB: Different tests are carried out (USA).

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features which impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-5: Particular requirements for dishwashers

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric dishwashers for household use that are intended for washing and rinsing dishes, cutlery and other utensils, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 101 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 102 This standard does not apply to

- commercial electric dishwashing machines (IEC 60335-2-58);
- appliances intended for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

ISO 1817:1985, *Rubber, vulcanized – Determination of the effect of liquids*

ISO 4046, *Paper, board, pulp and related terms – Vocabulary*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

operation of the appliance under the following conditions.

The appliance is operated with the maximum quantity of water for which it is constructed, without detergents or rinsing agents and without place settings or serving pieces. However if it is apparent that the test results will be affected by the load, the appliance is loaded with the maximum number of place settings and serving pieces specified in the instructions.

NOTE 101 The place settings and serving pieces to be used are specified in IEC 60436.

The water is supplied at any convenient pressure within the range specified in the instructions, the temperature of the water at the inlet being

- 60 °C ± 5 °C or that specified in the instructions if it is higher, for inlets intended for hot water only;
- 15 °C ± 5 °C for inlets intended for cold water only.

If the appliance has an inlet intended for hot or cold water, the most unfavourable water temperature is used

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.3 Addition:

The test of 15.101 is carried out before the test of 15.3.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Modification:

Appliances shall be **class I**, **class II** or **class III**.

6.2 Addition:

Appliances intended to stand on a draining board shall be at least IPX1.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances without automatic water-level control shall be marked with the maximum permissible water level.

7.6 Addition:



[symbol 5036 of IEC 60417-1]

dangerous voltage

7.10 Addition:

If the **off position** is only indicated by letters, the word "off" shall be used.

7.12 Addition:

The instructions shall state

- the maximum number of place settings to be washed;
- that the door should not be left in the open position since this could present a tripping hazard;
- how to load the dishwasher, and the substance of the following:

WARNING: Knives and other utensils with sharp points must be loaded in the basket with their points down or placed in a horizontal position.

If symbol 5036 of IEC 60417-1 is used, its meaning shall be explained.

7.12.1 Addition:

The installation instructions shall state

- that the appliance is to be connected to the water mains using new hose-sets and that old hose-sets should not be reused;
NOTE 101 This instruction is not required if the hoses are permanently attached to the appliance.
- the maximum permissible inlet water pressure, in megapascals, for appliances intended to be connected to the water mains;
- the minimum permissible inlet water pressure, in megapascals, if this is necessary for the correct operation of the appliance;
- for dishwashers with ventilation openings in the base, that a carpet must not obstruct the openings.

7.14 Addition:

The height of symbol 5036 of IEC 60417-1 shall be at least 5 mm.

Compliance is checked by measurement.

7.101 The enclosure of magnetic valves, and similar components incorporated in external hoses for direct connection to the water mains, shall be marked with symbol 5036 of IEC 60417 if their **working voltage** exceeds **extra-low voltage**.

NOTE This symbol is a warning sign and the rules of IEC 3864 apply.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable except as follows.

10.1 Addition:

NOTE 101 The selected representative period is the period during which the power input is the highest.

10.2 Addition:

NOTE 101 The selected representative period is the period during which the current is the highest.

11 Heating

This clause of Part 1 is applicable except as follows.

11.7 Replacement:

Appliances incorporating a programmer or timer are operated for two cycles with the programme that results in the highest temperature rises. The cycles are separated by a rest period of 15 min with the door or lid open.

Other appliances are subjected to two cycles of the sequence stated in the instructions that results in the highest temperature rises or for two periods of 15 min each, whichever is longer. The cycles or periods are separated by a rest period of 15 min with the door or lid open. Discharge pumps driven by a separate motor are then subjected to three periods of operation, each separated by a rest period of 15 min. The duration of each period of operation is 1,5 times the period necessary to empty the appliance when it is filled with the maximum quantity of water for which it is constructed. The level of the water discharge is

- 90 cm above the floor, for appliances standing on the floor;*
- the maximum height above the supporting surface, as stated in the instructions, for other appliances.*

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 Modification:

For stationary class I appliances, the leakage current shall not exceed 3,5 mA, or 1 mA/kW rated power input with a limit of 5 mA, whichever is higher.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

15.1 Addition:

Magnetic valves and similar components incorporated in external hoses for connection to the water mains are subjected to the test specified for IPX7 appliances.

15.2 Replacement:

Appliances shall be constructed so that spillage of liquid in normal use does not affect their electrical insulation, even if an inlet valve fails to close.

Compliance is checked by the following test.

*Appliances with a **type X attachment**, except those having a specially prepared cord, are fitted with the lightest permissible type of flexible cord of the smallest cross-sectional area specified in Table 13.*

Appliances intended to be filled with water by the user are completely filled with water containing approximately 1 % NaCl. A further quantity of this solution equal to 15 % of the capacity of the appliance or 0,25 l, whichever is greater, is poured in steadily over a period of 1 min.

Other appliances are operated until the maximum water level is reached, and 5 g of the detergent specified in Annex AA is added for each litre of water in the appliance. The inlet valve is held open and the filling continued for 15 min after first evidence of overflow or until the inflow is automatically stopped by other means.

For appliances that are loaded from the front, the door is then opened if this can be achieved manually and without damage to the door interlock system.

For appliances having a working surface, 0,5 l of water containing approximately 1 % NaCl and 0,6 % of rinsing agent, as specified in Annex AA, is poured over the top of the appliance, the controls being placed in the on position. The controls are then operated through their working range, this operation being repeated after a period of 5 min.

*The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

15.101 Appliances shall be constructed so that foaming does not affect electrical insulation.

Compliance is checked by the following test which is carried out immediately after that of 15.2.

The appliance is operated under the conditions specified in Clause 11 but for one complete cycle with the programme that results in the longest period of operation. A solution consisting of 20 g of NaCl and 1 ml of a solution of 28 % by mass of dodecyl sodium sulphate ($C_{12}H_{25}Na_2SO_4$), is added for each 8 l of water in the appliance.

For appliances incorporating a detergent dispenser, the solution is added manually at the point in the cycle when it would normally be dispensed automatically. For other appliances, the solution is added before starting the cycle.

The appliance shall then withstand the electric strength test of 16.3.

The appliance is then operated for two cycles under the same conditions, except that the solution is not added. It shall then withstand the electric strength test of 16.3.

The appliance is kept in a test room having a normal atmosphere for 24 h before being subjected to the test of 15.3.

NOTE The solution used for this test has to be stored in a cool atmosphere and used within seven days of its preparation.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is not applicable.

18 Endurance

This clause of Part 1 is applicable except as follows.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 Addition:

For appliances incorporating a programmer or timer, the tests of 19.2 and 19.3 are replaced by the test of 19.101.

19.2 Addition:

Restricted heat dissipation is obtained without water in the appliance or with just sufficient water to cover the heating elements, whichever is the more unfavourable.

19.9 Not applicable.

19.13 Addition:

During the tests of 19.101, the temperature of windings shall not exceed the values specified in Table 8.

19.101 *The appliance is supplied at rated voltage and operated under normal operation and. Any fault condition or unexpected operation that may be applied in normal use is introduced.*

NOTE 1 Examples of fault conditions and unexpected operations are

- the programmer stopping in any position;
- disconnection and reconnection of one or more phases of the supply during any part of the programme;
- open-circuiting or short-circuiting of components;
- failure of a magnetic valve;
- opening and reclosing of the door or lid during any part of the programme, if this is possible.

NOTE 2 Locking the main contacts of a contactor, used for energizing heating elements, in the 'on' position, is considered to be a fault condition, unless at least two independent sets of contacts are provided. This may be achieved by two contactors operating independently of each other or by one contactor having two independent armatures operating two independent sets of contacts.

NOTE 3 In general, tests are limited to the fault conditions that may be expected to give the most unfavourable results.

The simulation of component faults is limited to those that could expose the user to a hazard.

NOTE 4 If operation without water in the appliance is a more unfavourable condition for starting any programme, the tests with that programme are carried out with the water valve closed. This valve is not closed after the programme has started to operate.

NOTE 5 If the appliance stops at any particular point in the programme, the test with that fault condition is considered to be ended.

NOTE 6 The fault condition with

- the automatic filling device held open is covered by 15.2;
- thermal controls short-circuited is covered by 19.4;
- motor capacitors short-circuited or open-circuited are covered by 19.7.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 Modification:

The appliance is empty or filled as specified for normal operation, whichever is more unfavourable. Doors and lids are closed and any castors turned to the most unfavourable position.

Addition:

For appliances that are loaded from the front, compliance is also checked by the test of 20.101.

20.101 *The appliance is placed on a horizontal surface and a mass of 23 kg is placed on, or suspended from, the centre of the open door or any fully opened drawer, whichever is more unfavourable. Any castors are turned to the most unfavourable position.*

For appliances normally used on a table or similar support and incorporating a door having horizontal hinges and a horizontal rest position, a mass of 7 kg is used instead of a mass of 23 kg.

Appliances normally used on a table or similar support and which have a drawer are additionally tested with the drawer placed in the most unfavourable position and loaded with the maximum number of place settings in accordance with the instructions.

If a dishwasher is combined with a hob, the test is carried out with the appliance loaded as specified in IEC 60436, the point of application of the mass being at the centre of the outer edge of the open door or drawer.

The appliance shall not tilt.

20.102 *Doors and lids shall be interlocked so that the appliance can only be operated when the door or lid is closed, unless there is adequate protection against ejection of hot water when the door or lid is opened.*

Compliance is checked by inspection and by manual test.

NOTE Slight splashing occurring immediately after the door or lid has been opened is neglected.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.6 Modification:

Instead of coloured water, a solution composed of 0,6 ml of the rinsing agent specified in Annex AA per litre of distilled water is used.

Addition:

NOTE 101 Parts that withstand the ageing test specified in Annex BB are not considered to be parts where leakage could occur.

Drops of undiluted rinsing agent, as specified in Annex AA, are applied to the external surface of the parts from which rinsing agent could leak if a seal fails.

After the test, there shall be no rinsing agent on the insulation of internal wiring, if deterioration of the insulation could result in a hazard.

NOTE 102 The influence of opening and closing the door is taken into account.

NOTE 103 Leakage of rinsing agent onto porous material is taken into account if this material is in contact with internal wiring.

22.101 Appliances shall withstand the water pressure expected in normal use.

Compliance is checked by connecting the appliance to a water supply having a static pressure equal to twice the maximum permissible inlet water pressure or 1,2 MPa, whichever is higher, for a period of 5 min.

There shall be no leakage from any part, including the inlet water hose.

22.102 Appliances shall be constructed so that heating elements cannot come into contact with combustible material inside the appliance as a result of deformation of the heating elements or of parts supporting them.

Compliance is checked by inspection.

22.103 Appliances shall be constructed so that dishes and cutlery contacting heating elements during the drying period do not give rise to a fire hazard.

Compliance is checked by the following test.

*The appliance is placed on a piece of white pinewood board covered with tissue paper. Polyethylene disks, approximately 80 mm in diameter and 2 mm thick, are placed at the most unfavourable location, where possible directly in contact with the heating element. The appliance is supplied at 1,1 times **rated voltage** and operated for a drying period under **normal operation**.*

When smoke or odour is evident, or when one-third of the drying period has elapsed, whichever occurs first, the door or lid is opened.

Any flames, burning drops or glowing particles shall not spread fire to other parts of the appliance. Flames, except from the disks, shall extinguish within 30 s of opening the door or lid. The tissue paper shall not burn or the board become scorched.

NOTE 1 Tissue paper is specified in 6.86 of ISO 4046 as thin, soft and strong lightweight wrapping paper generally intended for packing delicate articles, its substance being between 12 g/m² and 30 g/m².

NOTE 2 The material of the disks used for the test is unfilled natural colour polyethylene without flame-retardants and has a relative density of $0,96 \pm 0,005$.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 Modification:

Instead of the test being carried out while the appliance is in operation, it is carried out with the appliance disconnected from the supply.

The number of flexings is increased to 100 000.

Addition:

After the test, not more than 10 % of the strands of any conductor of the internal wiring between the main part of the appliance and the door shall be broken.

23.101 The insulation and sheath of internal wiring for the supply of magnetic valves and similar components incorporated in external hoses for connection to the water mains shall be at least equivalent to light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52).

Compliance is checked by inspection.

NOTE The mechanical characteristics specified in IEC 60227 are not checked.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.4 Addition:

The number of cycles of operation for programmers is 3 000.

24.101 Thermal cut-outs incorporated in dishwashers for compliance with 19.4 shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable except as follows.

29.2 Addition:

The microenvironment is pollution degree 3, and the insulation shall have a CTI not less than 250, unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance due to

- condensation produced by the appliance;
- chemicals, such as detergent or rinse aid.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 Addition:

For appliances incorporating a programmer or a timer, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Annexes

The annexes of Part 1 are applicable except as follows.

Annex AA (normative)

Detergent and rinsing agent

AA.1 Detergent

The composition of the detergent is as follows:

Substance	Parts by mass
	%
Penta-sodiumtriphosphate ("Tripoly") Thermphos NW	50,00
Sodium metasilicate KO (anhydrous)	40,00
Sodium sulphate (anhydrous)	5,75
Sodium dichlorisocyanurate-dihydrate CDB 56 C	2,25
Plurafac RA 43 ¹⁾	2,00

The plurafac RA 43 is thoroughly mixed with the silicate and sulphate. The sodium dichlorisocyanurate-dihydrate is mixed into the phosphate. The two are then thoroughly mixed together.

NOTE 1 The detergent should be stored in a cool atmosphere in a waterproof bag in quantities not exceeding 1 kg. It should be used within three months.

NOTE 2 The composition of the detergent is extracted from IEC 60436.

AA.2 Rinsing agent

The composition of the rinsing agent is as follows:

Substance	Parts by mass
	%
Plurafac LF 221 ²⁾	15,0
Cumene sulfonate (40 % solution)	11,5
Citric acid (anhydrous)	3,0
Deionized water	70,5

The rinsing agent has the following properties:

- viscosity, 17 mPa·s;
- pH, 2,2 (1 % in water).

NOTE 1 Any commercially available rinsing agent may be used, but if there is any doubt with regards to the test results, this composition is to be used.

NOTE 2 The composition of the rinsing agent is extracted from IEC 60436.

- 1) Plurafac RA 43 is the trade name of a product supplied by BASF. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of this product.
- 2) Plurafac LF 221 is the trade name of a product supplied by BASF. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of this product.

Annex BB (normative)

Ageing test for elastomeric parts

The ageing test on elastomeric parts is carried out by measuring their hardness and mass before and after immersion in solutions of detergent and rinsing agent at elevated temperature.

The test is carried out on at least three samples of each part. The test procedure is as specified in ISO 1817, with the following modifications.

4 Test liquids

Two test liquids are used:

- one liquid is obtained by dissolving 6 g of the detergent specified in Annex AA per litre of distilled water;*
- the other liquid is composed of 0,6 ml of rinsing agent as specified in Annex AA per litre of distilled water.*

NOTE Care is to be 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 entire surface is freely exposed to the solution. During the tests, the test pieces are not to be exposed to direct light. Test pieces of different compounds are not to be immersed at the same time in the same solution.

5 Test pieces

5.4 Conditioning of test pieces

The temperature is $23\text{ °C} \pm 2\text{ °C}$ and the relative humidity is $(50 \pm 5)\%$.

6 Immersion in the test liquid

6.1 Temperature

The solution is heated within 1 h with the test pieces immersed, to a temperature of 75^{+5}_0 °C and maintained at this value. The solution is renewed every 24 h and heated in the same way.

NOTE To avoid undue evaporation of the solution, it is recommended to use a closed-circuit system or similar method for renewing the solution.

6.2 Duration

The test pieces are immersed for a total period of 48^{+1}_0 h .

The test pieces are then immediately immersed in a fresh solution, which is maintained at ambient temperature. The pieces are immersed for $45\text{ min} \pm 15\text{ min}$.

After having been removed from the solution, the test pieces are rinsed in cold water at $15\text{ °C} \pm 5\text{ °C}$ and then dried with blotting paper.

7 Procedure

7.2 Change in mass

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

7.6 Change in hardness

The micro-test for hardness applies.

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

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-58, *Household and similar electrical appliances – Safety – Part 2-58: Particular requirements for commercial electric dishwashing machines*

IEC 60436, *Methods for measuring the performance of electric dishwashers*

IEC 61770, *Electric appliances connected to the water mains – Avoidance of backsiphonage and failure of hose sets*