

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –  
Part 2-58: Particular requirements for commercial electric dishwashing  
machines**  
(<https://standards.iteh.ai/>)

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-58: Règles particulières pour les lave-vaisselle électriques à usage  
collectif**

IEC 60335-2-58:2002

<https://standards.iteh.ai/Catalogue/standards/iec/068fa22f-e242-42b1-9191-e53cef8a10e9/iec-60335-2-58-2002>

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INTERNATIONAL  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –  
SAFETY –****Part 2- 58: Particular requirements for commercial  
electric dishwashing machines**

## 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.
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This part of International Standard IEC 60335 has been prepared by IEC subcommittee 61E: Safety of electrical commercial catering equipment, of IEC technical committee 61: Safety of household and similar electrical appliances.

This consolidated version of IEC 60335-2-58 consists of the third edition (2002) [documents 61E/406/FDIS and 61E/418/RVD] and its amendment 1 (2008) [documents 61E/598/FDIS and 61E/613/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 3.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

The French version of this standard has not been voted upon.

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 commercial electric dishwashing machines.

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 of Part 1 concerns an adjective, the adjective and the associated noun are also in bold.

The following differences exist in the countries indicated below.

- 6.1: Class 01 appliances are allowed (Japan).
- 6.2: For appliances intended to be installed in a kitchen, an appropriate degree of protection against harmful ingress of water is required according to their height of installation (France).
- 13.2: Leakage current limits are different (Japan).
- 16.2: Leakage current limits are different (Japan).
- Clause 21: For appliances intended to be installed in a kitchen, different values of impact energy are applicable according to the height of the impact point (France).

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result date indicated on the IEC web site under "<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.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of the amendment 1 be adopted for implementation nationally not earlier than 12 months from the date of publication.

## 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 and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

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.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

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.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

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 that 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 2-58: Particular requirements for commercial electric dishwashing machines

#### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electrically operated dishwashing machines for washing plates, dishes, glassware, cutlery and similar articles, with or without means for water heating or drying, not intended for household use, their **rated voltage** being not more than 250 V for single-phase appliances connected between one phase and neutral and 480 V for other appliances.

NOTE 101 These appliances are used for example in restaurants, canteens, hospitals, and commercial enterprises such as bakeries, butcheries, etc.

NOTE 102 Examples of such appliances are

- **conveyor dishwashers;**
- **batch dishwashers;**
- **brush machines.**

Requirements to avoid backsiphonage of non-potable water into the water mains are specified in Annex CC.

The electrical part of appliances making use of other forms of energy is also within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances.

NOTE 103 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;
- for appliances intended for disinfection, 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;
- in many countries additional requirements are specified for pressure appliances.

NOTE 104 This standard does not apply to:

- appliances designed exclusively for industrial purposes, for example machines used in the food industry for cleaning receptacles that serve as packaging for final products (e.g. bottle-cleaning machines), and machines used in manufacturing processes;
- dishwashers that do not form one functional unit, for example where a transportation device transfers the load from one separate unit to another;
- separately driven transport devices not confined in the appliance;
- 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:*

IEC 60436:1981, *Methods for measuring the performance of electric dishwashers*

IEC 61770:1998, *Electric appliances connected to the water mains – Avoidance of back-siphonage and failure of hose-sets*

ISO 1817:1999, *Rubber, vulcanised – Determination of the effect of liquids*

## 3 Definitions

This clause of Part 1 is applicable except as follows.

### 3.1.4 Addition:

NOTE 101 The **rated power input** is the sum of the power inputs of all the individual elements in the appliance that can be on at one time; where there are several such combinations possible, that giving the highest power input is used in determining the **rated power input**.

### 3.1.9 Replacement:

#### **normal operation**

operation of the appliance under the following conditions

Appliances intended to be connected to a water supply are connected to a water supply having the pressure and temperature specified in the instructions.

If a range of temperatures and pressures is specified in the instructions then the water supply is at the conditions within the range that will give the most unfavourable temperature results. Water inlets intended for cold water only are connected to a source supplying water at a temperature of  $15\text{ °C} \pm 5\text{ °C}$ .

The appliance is filled with the maximum quantity of water for which it is designed, without detergents or rinsing agents. **Brush machines** are tested with dishes and the dishwasher is loaded with the maximum number of dishes specified in the instructions for use. The dimensions of the dishes are as specified in IEC 60436. Other appliances are tested without dishes.

**Batch dishwashers** are operated on continuous cycles, each cycle being followed by a rest period of 1 min. Lids or covers, if any, are left open during the rest period.

**Conveyor dishwashers** and **brush machines** are operated continuously.

The appliance is operated as follows:

- appliances with automatic timers or programmers are operated with the programme that will give the most unfavourable temperature results;
- appliances that have neither an automatic timer nor a programmer are operated in accordance with the instructions for use, but with the controls intended to be set by the user set at maximum or that setting giving the most unfavourable temperature results.

**3.101****conveyor (rack or flight) dishwasher**

an appliance in which the various processes e.g. washing, rinsing etc., are carried out, the load being moved through the various operations automatically

**3.102****batch dishwasher**

an appliance in which the various processes are carried out sequentially on a single load

**3.103****brush machine**

an appliance in which plates are cleaned by being placed between or held in contact with brushes or similar devices

**3.104****indicated level**

a mark on the appliance to indicate the maximum liquid level for correct operation

**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 tests of 22.6 are carried out before the tests of Clause 19.*

**5.101** Appliances are tested as **motor-operated appliances**, even if they incorporate a heating element.

*Appliances incorporating means for heating water, but that may also be operated without the heating elements being energized, are tested without the heating elements energized should this be more unfavourable.*

**5.102** Appliances, when assembled in combination with or incorporating other appliances, are tested in accordance with the requirements of this standard. The other appliances are operated simultaneously in accordance with the requirements of the relevant standards.

**6 Classification**

This clause of Part 1 is applicable except as follows.

**6.1 Replacement:**

Appliances shall be **class I** with respect to protection against electric shock.

*Compliance is checked by inspection and by the relevant tests.*

## 6.2 Modification:

Replace the requirement paragraph with the following.

Appliances shall be at least IPX1 with respect to protection against harmful ingress of water.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

In addition, appliances shall be marked with

- the water pressure or range of pressures, in kilopascals (kPa), for appliances intended to be connected to a water supply, unless this is indicated in the instruction sheet;
- the maximum permissible steam pressure, in kilopascals (kPa), unless this is indicated in the instruction sheet;
- the maximum permissible hot water pressure, in kilopascals (kPa), unless this is indicated in the instruction sheet;
- the maximum permissible water, steam and hot water temperatures in degrees Celsius, unless this is indicated in the instruction sheet.

If the reversal of a motor could result in a hazard, the direction of rotation shall be clearly and visibly indicated on the motor.

### 7.6 Addition:



[symbol 5021 of IEC 60417-1] equipotentiality

### 7.12 Addition:

If symbol 5021 of IEC 60417-1 is marked on the appliance its meaning shall be explained.

#### Modification:

The instruction concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge is not applicable.

#### 7.12.1 Replacement:

The appliance shall be accompanied by instructions detailing any special precautions necessary for installation. The maximum level of the water discharge outlet shall be indicated in the instructions. Instructions for **user maintenance**, for example cleaning, shall also be given. They shall include a statement that the appliance is not to be cleaned with a water jet.

For appliances that are permanently connected to fixed wiring and for which leakage currents may exceed 10 mA, particularly if disconnected or not used for long periods, or during initial installation, the instructions shall give recommendations regarding the rating of **protective devices**, such as earth leakage relays, to be installed.

*Compliance is checked by inspection.*

#### 7.12.4 Addition:

The instructions for **built-in appliances** having a separate control panel for several appliances shall state that the control panel is only to be connected to the specified appliances in order to avoid a possible hazard.

#### 7.15 Addition:

When it is not practical to place the marking of **fixed appliances** so that it is visible after the appliance has been installed, the relevant information shall also be included in the instructions for use or on an additional label that can be fixed near the appliance after installation.

NOTE 101 An example of such a **fixed appliance** is a **built-in appliance**.

**7.101** Appliances intended to be filled by hand or a manually operated tap shall be marked with an **indicated level**.

*Compliance is checked by inspection.*

**7.102** Equipotential bonding terminals shall be marked with symbol 5021 of IEC 60417-1.

These markings shall not be placed on screws, removable washers or other parts that can be removed when conductors are being connected.

*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 applicable except as follows.

**9.101** Fan motors providing a cooling effect in order to comply with the requirements of Clause 11 shall start under all voltage conditions that may occur in use.

*Compliance is checked by starting the motor three times at a voltage equal to 0,85 times **rated voltage**, the motor being at room temperature at the beginning of the test.*

*The motor is started each time under the conditions occurring at the beginning of **normal operation** or, for automatic appliances, at the beginning of the normal cycle of operation, the motor being allowed to come to rest between successive starts. For appliances provided with motors having other than centrifugal starting switches, this test is repeated at a voltage equal to 1,06 times **rated voltage**.*

*In all cases, the motor shall start and it shall function in such a way that safety is not affected and overload **protection devices** of the motor shall not operate.*

NOTE The supply source must be such that during the test the drop in voltage does not exceed 1 %.

## 10 Power input and current

This clause of Part 1 is applicable except as follows.

### 10.1 Addition:

NOTE 101 A representative period is the period with the highest total power input.

## 11 Heating

This clause of Part 1 is applicable except as follows.

### 11.2 Addition:

*Appliances intended to be fixed to the floor and appliances with a mass greater than 40 kg and not provided with rollers, castors or similar means are installed in accordance with the instructions. If no instructions are given, these appliances are considered as appliances normally placed on the floor. However, appliances provided with heating elements for drying, except **conveyor dishwashers**, are placed in the test corner as near to the walls as possible.*

### 11.5 Addition:

**Conveyor dishwashers** may be supplied at **rated voltage**. In this case the addition to 11.8 applies.

### 11.7 Replacement:

*Appliances are operated until steady conditions are established.*

NOTE 101 The duration of the test may consist of more than one cycle of operation.

*At the conclusion of the test and with the appliance at maximum temperature, motor-driven emptying pumps that employ separate motors and that are manually switched on and off are subjected to an operating period equal to 1,5 times the period for emptying the container(s) when filled to the **indicated level**, the level of the water discharge outlet being the maximum indicated in the instructions.*

### 11.8 Addition:

For **conveyor dishwashers** tested at **rated voltage**, the relevant values shown in Table 3 are reduced by 10 %.

## 12 Void

## 13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

### 13.1 Addition:

**Conveyor dishwashers** may be supplied at **rated voltage**. In this case the permissible leakage current allowed is reduced by 10 %.