IEC 60335-2-118

Edition 1.0 2020-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-118: Particular requirements for professional ice-cream makers

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-118: Exigences particulières pour les fabriques de crème glacée à usage professionnel

IEC 60335-2-118:2020-03(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 60335-2-118 has been prepared by subcommittee 61C: Safety of refrigeration appliances for household and commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances.

The text of this International Standard is based on the following documents:

CDV	Report on voting
61C/798/CDV	61C/823A/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

A list of all parts of the IEC 60335 series, under the general title *Household and similar electrical appliances – Safety*, can be found on the IEC website.

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 fifth edition (2010) 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 professional ice-cream makers.

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 the associated noun are also in bold.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

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 2-118: Particular requirements for professional ice-cream makers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of appliances for making ice cream and artisan gelato.

Appliances taken into account are those intended for commercial use and similar appliances not intended for normal household use but which may nevertheless be a source of danger to the public, such as appliances intended to be used by laymen in shops, stores, by artisans or on farms, which rated voltage is not more than 250 V for single-phase appliances and 480 V for other appliances.

Appliances covered by this standard are provided with a refrigerant condensing unit which is usually incorporated, but for some appliances may be remote.

This standard also applies to following types of appliances:

- mixers to make ice cream and similar pastry products in which, for the preparation of the product, an heating process is made within the appliance before the cooling process;
- appliances for storing whipping cream mix in a refrigerated tank and for whipping the cream for the delivery process.

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 can 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.

This standard does not apply to:

– appliances with a refrigerating system operating with flammable refrigerant;

– ice cream appliances for household use (IEC 60335-2-24);

– appliances intended exclusively 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:

IEC 60335-2-34:2012, *Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor-compressors*
IEC 60335-2-34:2012/AMD1:2015
IEC 60335-2-34:2012/AMD2:2016

IEC 60598-1:2014, *Luminaires – Part 1: General requirements and tests*
IEC 60598-1:2014/AMD1:2017

IEC 60947-5-1, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

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

ISO 817:2014, *Refrigerants – Designation and safety classification*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.9 *Addition:*

3.1.9.101
normal operation for ice cream making appliances
ice cream making appliances operated under the following conditions:

The appliance uses the maximum quantity of the mixture of ingredients indicated in the instructions which gives the most unfavourable results, the mixture being at an initial temperature of 23 °C ± 2 °C.

Appliances are operated the time necessary to reach steady state conditions.

For appliances connected to a water supply, the water other than cooling water, is at a temperature of 15 °C ± 2 °C and at and the most unfavourable pressure specified in the instructions. The cooling water is at the temperature specified in 5.7.

For appliances with a separate **refrigerant unit**, the **refrigerant unit** is connected to the cabinet in accordance with the manufacturer's instructions.

3.1.9.102
normal operation for pasteurising ice cream making appliances
pasteurising ice cream making appliances operated under the following conditions:

Appliances are operated at ambient temperature as indicated in 5.7.

The appliance is filled using the maximum quantity of the mixture of ingredients indicated in the instructions which gives the most unfavourable results, the mixture being at an initial temperature of 23 °C ± 2 °C.

The appliance shall be operated for the time necessary for the mix to reach the maximum pasteurisation temperature and then, for the cooling process, for the number of cycles needed to reach steady state conditions.

3.1.9.103
normal operation for cream whipping appliances
cream whipping appliances operated under the following conditions:

Appliances are operated at an ambient temperature as indicated in 5.7.

The appliance is filled with liquid cream being kept at preservation temperature of 4 °C ± 1 °C in the maximum quantity prescribed by the instructions and shall be operated the time necessary to reach steady state conditions.

The appliance is operated in continuous or cyclic mode, following the instructions for user.

3.101
compression-type appliance
appliance in which refrigeration is effected by the vaporisation at low pressure in a heat exchanger (**evaporator**) of a liquid refrigerant, the vapour thus formed being restored to the liquid state by mechanical compression at a higher pressure and subsequent cooling in another heat exchanger (**condenser**)

3.102
condenser
heat exchanger in which, after compression, vaporised refrigerant is liquefied by rejecting heat to an external cooling medium

3.103
evaporator
heat exchanger in which, after pressure reduction, the liquid refrigerant is vaporised by absorbing heat from the medium to be refrigerated

3.104
refrigerant unit
factory assembled unit for performing part of the refrigeration cycle (compressing gas, condensation or gas cooling) comprising one or more refrigerant compressors with motors, condensers, liquid receivers, interconnecting pipe work and ancillary equipment all mounted on a common base

3.105
heating system
heating element with associated components such as timers, switches, **thermostats** and other controls

3.106
ancillary heating element
heating device which performs an auxiliary function, such as a defrost heater, door heater or anti-condensation heater

3.107
pasteurising cycle
cycle during which the mixture is brought to the pasteurising temperature and then immediately cooled down to a preservation temperature ≤ 5 °C

3.108
skilled person
person having the appropriate training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures to minimise the danger to themselves or other persons

3.109
free space
any space with a volume exceeding 60 l where a child can be entrapped and which is accessible after opening any door, lid or drawer and removing any detachable internal parts, including shelves, containers or drawers which are only accessible after opening any door, lid or drawer

In calculating the volume, a space with any single dimension not exceeding 150 mm or any two orthogonal dimensions each of which do not exceed 200 mm is ignored.

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.

5.2 *Addition:*

NOTE 101 Separate samples of the motor-compressor can be needed for the tests of 19.1.

5.3 *Addition:*

The test of 15.101 is carried out immediately after the test of 15.2.

5.4 *Replacement:*

For appliances intended to be connected to water supply, water is supplied at the appropriate rated pressure, according to the instructions.

5.7 *Addition:*

Tests according to Clauses 10, 11, 13 and 19.103 are carried out at an ambient temperature of:

– *32 °C ± 1 °C on appliances of extended temperate (SN) and temperate (N) classes;*
– *38 °C ± 1 °C on appliances of subtropical (ST) class;*
– *43 °C ± 1 °C on appliances of tropical (T) class.*

and for appliances connected to a water supply for cooling at a water temperature

– *20 °C ± 1 °C on appliances of extended temperate (SN) and temperate (N) classes;*
– *25 °C ± 1 °C on appliances of subtropical (ST) class;*
– *30 °C ± 1 °C on appliances of tropical (T) class.*

Other tests are carried out at an ambient temperature of 20 °C ± *5* °C *and with cooling water at a temperature of 15 °C ± 2 °C.*

Appliances classified for several climatic classes are tested at the ambient temperature relevant to the highest climatic class.

NOTE 101 Steady conditions are considered to be established when three successive readings of the temperature, taken at approximately 60 min intervals, at the same point of any operating cycle, do not differ by more than1 K.

5.101 ***Compression-type appliances*** *with* ***heating systems*** *are tested as* ***combined appliances****.*

6 Classification

This clause of part 1 is applicable except as follows.

6.1 *Replacement:*

For appliances provided with hoses and water outlets for cleaning internal parts designed for ice cream production, the protection against harmful ingress of water shall be at least IPX1.

6.101 Appliances shall be of one or more of the following climatic classes:

– appliances of extended temperate class (SN);
– appliances of temperate class (N);
– appliances of subtropical class (ST);
– appliances of tropical class (T).

Compliance is checked by inspection.

NOTE The climatic classes are specified in IEC 62552-1:2015.

7 Marking and instructions

This clause of part 1 is applicable except as follows.

7.1 *Modification:*

Replace the third dash by:

– **rated current** in watts and/or amperes;

Addition:

Appliances shall also be marked with:

– the power input, in watts and/or amperes, of heating systems, if greater than 100 W;
– the letters SN, N, ST or T indicating the climatic class of the appliance;

– the total mass of the refrigerant for each separate refrigerant circuit;
– for a single component refrigerant, at least one of the following:
  - the chemical name,
  - the chemical formula,
  - the refrigerant number;
– for a blended refrigerant, at least one of the following:
  - the chemical name and nominal proportion of each of the components,
  - the chemical formula and nominal proportion of each of the components,
  - the refrigerant number and nominal proportion of each of the components,
  - the refrigerant number of the refrigerant blend;
– the chemical name or refrigerant number of the principal component of the insulation blowing gas;

Refrigerant numbers shall be designated in accordance with ISO 817.

– serial number and year of construction.

NOTE 101 Pipe insulation or small items of insulation are not required to be marked.

Appliances without automatic water level control shall be marked with the maximum permissible water level. Appliances shall be marked with details of the source of supply other than electrical, if any.

7.2 *Addition:*

NOTE 101 As an alternative, temperature values in degrees Celsius can be indicated on a control scale.

7.12 *Modification:*

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge and children playing with the appliance are not required.

7.12.1 *Addition:*

For appliances with a separate **refrigerant unit**, the instructions shall include a statement containing the substance of the following:

> The installation of the appliance and the **refrigerant unit** must only be made by the manufacturer's service personnel or similarly **skilled person**.

The information provided with an appliance without an incorporated **refrigerant unit** shall include the substance of the following:

– information on the type of separate **refrigerant unit** to which the cabinet shall be connected;
– an electrical diagram showing the electrical terminals for connections and the functions of the control system;
– the recommended evaporating pressure and heat extraction rate;
– the maximum input current of each connection.

Instructions shall include the method for replacing illuminating lamps.

The instructions shall include information on the installation of ancillary devices which are available as optional accessories and intended to be installed by the user. If it is intended that incorporated ancillary devices are to be installed only by the manufacturer or its service agent, this shall be stated.

The instructions for appliances intended to be connected to the water supply shall state:

– the maximum permissible inlet water pressure, in pascals or bars;
– the minimum permissible inlet water pressure, in pascals or bars, if this is necessary for the correct operation of the appliance;

– the substance of the following warning:

WARNING – connect to potable water supply only,

If the appliance is constructed so that it is not protected against water jets, clear and detailed instructions for the user shall be delivered together with the appliance. It shall be stated in the instructions that these appliances shall not be cleaned with a water jet.

7.15 *Addition:*

The marking of the maximum rated wattage of illuminating lamps shall be easily discernible while the lamp is being replaced.

Equipotential bonding terminals shall be indicated by symbol number 5021 as specified in IEC 60417-5021 (2002-10).

These indications shall not be placed on screws, removable washers or other parts which 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 except as follows.

8.1.1 *Addition:*

*Where an appliance has parts which require adjustment under operating conditions by a **skilled person** after removal of **non-detachable parts**, **live parts** shall not be accessible and they shall be protected at least by **basic insulation**.*

NOTE 101 Examples of adjustable parts are inaccessible **thermostats**, **temperature limiters** and thermostatic expansion valves.

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 *Modification:*

Replace the third dash item of the first paragraph of the test specification by the following:

– *the appliance being operated under **normal operation** except that user adjustable temperature controls are set to give the lowest temperature allowed by the instruction manual.*

Addition:

*The input to be considered is the maximum power input measured, excluding starting power input but including the power input of the **incorporated ancillary devices**, if any.*

10.2 *Modification:*

Replace the third dash item of the first paragraph of the test specification by the following:

– *the appliance being operated under normal operation except that user adjustable temperature controls are set to give the lowest temperature allowed by the instruction manual.*

Addition:

*The current to be considered is the maximum current measured, excluding starting current but including the current of the **incorporated ancillary devices**, if any.*

NOTE 101 Starting current is considered to be excluded if the first current measurement is made approximately 1 min after starting.

10.101 The power input of any heating system shall not deviate from the power input of these systems marked on the appliance by more than the deviation shown in Table 1.

*Compliance is checked by operating the appliance at **rated voltage** and measuring the power input of the **heating system** after the power input has stabilised.*

11 Heating

This clause of part 1 is applicable except as follows.

11.1 *Addition:*

Compliance is checked by determining the temperature rise of the various parts under the conditions specified in 11.2 to 11.7.

If the winding temperatures of motor-compressors exceed the values given in Table 101, compliance is checked by the test of 11.101.

The winding temperatures of motor-compressors complying with IEC 60335-2-34:2012 including its Annex AA are not measured.

11.2 *Replacement:*

***Built-in appliances** are installed in accordance with the instructions for installation.*

Other appliances normally placed on a floor or table in use are placed on the floor of a test corner as near to the walls as possible, unless the manufacturer indicates in the instructions for installation that a free distance shall be observed from the walls or the ceiling, in which case this distance is observed during the test.

The appliance installed as above is placed in a room maintained at an ambient temperature according to 5.7 with the doors or lids open until the whole assembly is at room temperature.

11.7 *Replacement:*

The appliance is operated for a number of cycles such that at least one hour running is obtained, or until steady conditions are established, whichever is the most unfavourable.

11.8 *Modification:*

Replace the paragraphs above Table 3 by the following.

*During the test, **protective devices** other than self-resetting thermal motor-protectors for motor-compressors shall not operate. When steady conditions are established, thermal motor-protectors for motor-compressors shall not operate.*

During the test, sealing compound, if any, shall not flow out.

During the test, temperature rises are monitored continuously.

For appliances of extended temperate (SN) or temperate (N) class, the temperature rises shall not exceed the values given in Table 3.

For appliances of subtropical (ST) or tropical (T) class, the temperature rises shall not exceed the values given in Table 3 reduced by 7 K.

Addition:

For motor-compressors not conforming to IEC 60335-2-34:2012 (including its Annex AA), the temperatures of:

– *housings of motor-compressors, and*

– *windings of motor-compressors*

shall not exceed the values given in Table 101.