IEC 60335-2-89

Edition 2.0 2015-05

INTERNATIONAL STANDARD

AMENDMENT 2

Household and similar electrical appliances – Safety – Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor

IEC 60335-2-89:2010-02/AMD2:2015-05(en)

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FOREWORD

This amendment has been prepared by sub-committee 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 amendment is based on the following documents:

FDIS	Report on voting
61C/598/FDIS	61C/604/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

NOTE 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 this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

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1 Scope

In Note 104 replace “ISO 5149” *by* “ISO 5149-1”.

2 Normative references

Delete references IEC 60079-4A *and* IEC 60079-20 *from the existing list.*

Add the following new reference:

IEC 60079-20-1, *Explosive atmospheres – Part 20-1: Material characteristics for gas and vapour classification – Test methods and data*

Replace the reference to ISO 817 *by the following new reference:*

ISO 817, *Refrigerants – Designation and safety classification*

Replace the reference to IS0 5149 *by the following new reference:*

ISO 5149-1, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria*

3 Terms and definitions

3.101 *In the term definition delete "enclosed".*

3.105 *In the term definition replace "ISO 5149" by "*ISO 5149-1*".*

3.109 *Add the following Note to entry.*

Note 1 to entry: The **design pressure** assigned should take into account pressures that could be expected during transportation of the **transcritical refrigeration system**.

3.111 *Add "during abnormal operation" to the end of the term definition.*

5 General conditions for the tests

5.2 *Add the following paragraph to the addition.*

Unless the motor-compressor complies with IEC 60335-2-34, at least one additional specially prepared sample is required for the tests of 22.103.

5.10 *Delete the second paragraph of the addition.*

*In the existing third paragraph of the addition replace "Other appliances" by "Appliances, other than **built-in appliances**,"*

Add the following as a new third paragraph to the addition.

*For appliances incorporating remote **refrigerant units** or remote motor-compressors, the refrigerant line between the **refrigerant unit** or motor-compressor and the **refrigerated display and storage cabinet** shall have a length of 5 m to 7,5 m. The refrigerant line shall be installed with thermal insulation applied in accordance with the instructions. If the appliance employs a **transcritical refrigeration system**, a **pressure relief device** shall be installed on the high pressure side between the motor-compressor and the **gas cooler** unless it is pre-fitted to the motor-compressor.*

7 Markings and instructions

7.1 *In the paragraph after Note 101, replace* "the symbol "Caution: risk of fire" *with* "symbol ISO 7010 W021".

7.6 *In the note, replace* "the symbol "Caution: risk of fire" *with* "symbol ISO 7010 W021".

7.12 *Add the following:*

If symbol ISO 7010 W021 is used, its meaning shall be explained.

7.14 *In the first paragraph, replace* "the symbol "Caution: risk of fire" *with* "symbol ISO 7010 W021".

7.15 *In the third paragraph, replace* "symbol "Caution: risk of fire" *with* "symbol ISO 7010 W021".

22 Construction

22.103 *Add the following sentence to the end of the second paragraph of the requirement* "This requirement is not applicable where the pressure is controlled automatically by shutting down the motor-compressor."

In the second paragraph of the test specification replace "raised gradually" by "gradually increased hydraulically" and change the style of the first dashed item to italic type.

22.104 *Replace the text by the following:*

Accessible glass panels with an area having any two orthogonal dimensions exceeding 75 mm shall be made from

- glass that breaks into small pieces when it fractures; or
- glass that is not released or dropped from its normal position when broken.

a) For glass that breaks into small pieces when it fractures, compliance is checked by the following test which is performed on two samples.

Frames or other parts attached to the glass panel to be tested are removed and the glass is placed on a rigid horizontal flat surface.

NOTE 1 The edges of the sample to be tested are contained within a frame of adhesive tape in such a manner that the broken pieces remain in place after breakage but without hindering expansion of the sample.

The sample under test is broken by means of a test punch having a head with a mass of 75 g ± 5 g and a conical tungsten carbide tip with an angle of 60° ± 2°. The punch shall be positioned approximately 13 mm in from the longest edge of the glass at the midpoint of that edge. The punch is then hit by a hammer so that the glass breaks.

A transparent mask of 50 mm × 50 mm is placed on the fractured glass except within a peripheral margin of 25 mm from the edge of the sample.

The assessment shall be undertaken on at least two areas of the sample, and the areas chosen shall contain the largest particles.

The number of crack free particles within the mask are counted and for each assessment shall not be less than 40. The particle count shall be made within 5 minutes of the fracture. Each particle wholly contained within the area of the mask shall be counted as one particle and each particle that is partially within the mask shall be counted as a half particle.

NOTE 2 In the case of curved glass, plane pieces of the same material can be used for the test.

b) For glass that is not released or dropped from its normal position when broken, compliance is checked by braking the glass when mounted in its normal position in the appliance by means of a test punch having a head with a mass of 75 g ± 5 g and a conical tungsten carbide tip with an angle of 60° ± 2°. The punch shall be positioned approximately 13 mm in from the longest edge of the glass at the midpoint of that edge. The punch is then hit by a hammer so that the glass breaks.

At the conclusion of this test, the glass shall not be broken or cracked in such a way that pieces are released or dropped from their normal position. Glass that is released within the immediate vicinity of the punch tip as a result of the punch impacting the sample under test is ignored.

22.109 *In the requirement, replace* "ignition" **by** "auto-ignition".

Replace Table 102 by the following:

Table 102 – Refrigerant flammability parameters

Refrigerant number	Refrigerant name	Refrigerant formula	Refrigerant auto-ignition temperature [a, c] °C	Refrigerant lower explosive limit [b, c, d, e] % V/V
R50	Methane	CH_4	600	4,4
R290	Propane	$CH_3CH_2CH_3$	450	1,7
R600	n-Butane	$CH_3CH_2CH_2CH_3$	372	1,4
R600a	isobutane	$CH(CH_3)_3$	460	1,3

[a] Values for other **flammable refrigerants** can be obtained from IEC 60079-20-1 and ISO 5149-1.

[b] Values for other **flammable refrigerants** can be obtained from IEC 60079-20-1 and ISO 817.

[c] IEC 60079-20-1 is the reference standard. ISO 5149-1 and ISO 817 may be used if the required data is not contained in IEC 60079-20-1.

[d] Concentration of refrigerant in dry air.

[e] In some standards, the term "flammability limit" is used for "explosive limit".

24 Components

24.1.4 *Add the following to the end of the subclause:*

*Replaceable **bursting discs** in **bursting disc assemblies** need only be marked with their operating pressure.*

Add the following new subclause:

24.7 *Modification:*

For coupling nuts used with hose-sets marked 25 °C max, the 96 h ageing test is carried out at a temperature of

- *32 °C ± 2 °C on hoses sets supplied with appliances of climatic class 0, 1, 2, 3, 4, 6 or 8;*
- *43 °C ± 2 °C on hoses sets supplied with appliances of climatic class 5 or 7.*

24.101 *Replace the requirement by the following.*

Pressure relief devices shall be such that they are able to operate so that the pressure during abnormal operation of the appliance does not increase beyond the pressure setting of the **pressure relief device**, even if the motor-compressor is operating.

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