STANDARDS UPDATE NOTICE (SUN)
ISSUED: April 27, 2018

STANDARD INFORMATION

This SUN establishes the Continuing Certification approach to Household and Similar Electrical Appliances - Safety - Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers

Standard Number: UL 60335-2-24 / CSA C22.2 No. 60335-2-24
Standard Name: Household and Similar Electrical Appliances - Safety - Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers
Standard Edition and Issue Date: 2nd Edition Dated April 28, 2017
Date of Revision: April 28, 2017
Date of Previous Revision of Standard: 1st Edition Revised February 27, 2015

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **No action is required for currently certified products to maintain certification. This SUN is being presented to assist users of the standard to appreciate the significance of the changes made to the standard that will apply should the product described be modified after March 31, 2019**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. NOTE: Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes: This new edition of ANSI/UL 60335-2-24, the harmonized Standard for Household and Similar Electrical Appliances – Safety – Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers, UL 60335-2-24, is based off of Edition 7.1 of IEC 60335-2- 24. Specific details of new/revised requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below.
5	Info	**General conditions for the tests**
5.7DV		~~D2 Modification – National Difference in Canada, Mexico, and the U.S.: Revise NOTE 101 to state that the readings may be "taken at the same point of any operating cycle."~~ D1 Modification of Clause 5.7 of the Part 2 by replacing the second paragraph and three temperatures for the various climatic classes as follows: For other appliances, tests specified in Clauses 10, 11, 13 and Clause 19.103 are carried out at an ambient temperature of 43 °C ± 1 °C (109,4 °F ± 1,8 °F).
6	Info	**Classification**
6.1DV.1		~~In Canada and the U.S., Class 0 and Class 01 appliances do not apply~~. D1 Modification to replace Clause 6.1DV.1 of the Part 1 with the following: Class 0 and Class 0I appliances are not allowed.
6.1DV.2		~~In Mexico, Class 0 appliances do not apply.~~
6.101DV		~~D2 Modification – National Difference in Canada and the U.S.: Appliances shall be of tropical Class (T).~~ This clause of the Part 2 is not applicable.
7	Info	**Marking and instructions**
7.1		Addition: Appliances shall also be marked with – the power input, in watts, of HEATING SYSTEMS, if greater than 100 W; – the defrosting input, in watts, if greater than the input corresponding to the RATED POWER INPUT; – RATED POWER INPUT in watts or RATED CURRENT in amperes, except that COMPRESSION-TYPE APPLIANCES, other than ICE-CREAM APPLIANCES, shall be marked only with the RATED CURRENT in amperes; – the letters SN, N, ST or T indicating the climatic class of the appliance; – the maximum rated wattage of lamps, in watts (not applicable if the lamps can only be replaced by the manufacturer, together with a part of the appliance);

	– the total mass of the refrigerant; COMPRESSION-TYPE APPLIANCES which use FLAMMABLE REFRIGERANTS shall be marked with ~~warning sign B.3.2 from ISO 3864.~~ the symbol "Caution: risk of fire". Appliances employing R-744 in a TRANSCRITICAL REFRIGERATION SYSTEM shall be marked with the substance of the following: WARNING: System contains refrigerant under high pressure. Do not tamper with the system. It must be serviced by qualified persons only. Appliances employing R-744 in a TRANSCRITICAL REFRIGERATION SYSTEM shall be marked with symbol ISO 7000 – 1701 (2004-01).
7.1DV	~~D2 Modification – National Difference in Canada, Mexico, and the U.S.:~~
7.1DV.1	~~Refrigerators shall be marked with the manufacturing date identification for 3-consecutive month period and year. This information shall not repeat in less than 10 years and when coded shall appear on the serial plate.~~ ~~NOTE – 7.1DV.1 applies to the U.S. only.~~ D2 Modification of Clause 7.1 of the Part 2 as follows: Delete the fourth dashed item of the first paragraph.
7.1DV.2	~~An electrical accessory intended for field installation in or on a refrigerator shall be permanently marked with the name or identifying symbol of the manufacturer or private labeler, and with a catalog number or equivalent designation. The identification shall be on the accessory or the carton in which it is shipped. The associated refrigerator shall be marked to indicate the catalog number or equivalent designation of such an accessory and the name of the manufacturer or private labeler of that accessory when other than the refrigerator manufacturer.~~ D2 Modification of Clause 7.1 of the Part 2 by adding the following (US only): Appliances shall also be marked with the date of manufacture that will enable the product to be identified as being manufactured within a consecutive 3-month period. This information may be in code and shall be located on or near the nameplate. A date code marking shall be such that it does not repeat in less than 10 years.
7.1DV.3	~~Climate class markings (SN), (N), (ST), and (T) are not required.~~ D2 Modification of Clause 7.1 of the Part 2 by adding the following: If a manufacturer produces appliances at more than one factory, each unit shall have a permanent distinctive marking to identify it as the product of a particular factory.

7.1DV.4.2	In the US, the markings of Clause 7.1DV.4.1 shall be in letters no less than 6,4-mm (1/4-in) high.
7.1DV.4.3	In Canada, the markings of Clause 7.1DV.4.1 shall be in letters no less than 3,2-mm (1/8-in) high.
7.1DV.4.4	For COMPRESSION-TYPE APPLIANCES which use FLAMMABLE REFRIGERANTS, the refrigeration tubing or other devices through which the refrigerant is intended to be serviced shall be painted or colored red, Pantone® Matching System (PMS) No. 185. This color shall be present at all places where service puncturing or otherwise creating an opening in the refrigerant circuit might be expected. In the case of a process tube on a compressor, the color mark shall extend at least 2,5 cm (1 in) from the compressor.
7.1DV.5	DR Modification of Clause 7.1 of the Part 2 by adding the following: Permanently connected equipment shall be marked with the individual electrical loads, the minimum circuit ampacity, and the maximum current rating of the supply circuit overcurrent protection. The minimum circuit ampacity is equal to 125% of the highest motor, heater, or compressor current rating plus the sum of all other current ratings of concurrent loads. The maximum overcurrent protection is equal to 225% of the highest motor or compressor current rating plus the sum of all other current ratings of concurrent loads.
7.1DV.6	D2 Modification of Clause 7.1 of the Part 2 as follows: Replace the “symbol “Caution: risk of fire”” with “symbol ISO 7010 W021”
7.6	Addition: ~~The perpendicular height of the triangle containing the warning sign B.3.2 from ISO 3864 shall be at least 15 mm.~~ ***New picture added;***  Symbol IEC 60417-5005 (2002-10) Plus; positive polarity Symbol IEC 60417-5006 (2002-10) Minus; negative polarity  Symbol ISO 7010 W021 Warning; Risk of fire/flammable materials  Symbol ISO 7000-1701 (2004-01) Pressure NOTE: The rules for warning signs in ISO 3864-1 apply to the colour and shape of the symbol ”Caution: risk of fire.”

	Addition: The instructions shall state the substance of the following. Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance. If symbol ISO 7000-1701 (2004-01) is used, its meaning shall be explained. The instructions shall include the substance of the following:
7.12	This appliance is intended to be used in household and similar applications such as – staff kitchen areas in shops, offices and other working environments; – farm houses and by clients in hotels, motels and other residential type environments; – bed and breakfast type environments; – catering and similar non-retail applications. NOTE 104: If the manufacturer wants to limit the use of the appliance to less than the above, this has to be clearly stated in the instructions.
7.12.1	Addition: In appliances employing R-744 in a TRANSCRITICAL REFRIGERATION SYSTEM the instructions shall include the substance of the following: WARNING: The refrigeration system is under high pressure. Do not tamper with it. Contact qualified service personal before disposal.
7.14	Addition: The height of the triangle in the symbol "Caution: risk of fire" shall be at least 15 mm. The height of the letters used for the marking of the type of flammable insulation blowing gas shall be at least 40 mm.
7.15	Addition: The marking of the maximum rated wattage of illuminating lamps that can be replaced by the user shall be easily discernible while the lamp is being replaced. For COMPRESSION-TYPE APPLIANCES the marking of the type of FLAMMABLE REFRIGERANT and of the flammable insulation blowing gas, as well as ~~warning sign B.3.2 from ISO 3864~~ the symbol "Caution: risk of fire", shall be visible when gaining access to the motor-compressors. For other appliances the marking of the type of flammable insulation blowing gas shall be on the external enclosure.
7.101	For appliances which can be battery operated, the supply terminals or

		terminations for connections to the battery shall be clearly indicated by ~~the symbol "+" or the colour red for the positive polarity, and by the symbol "-" or the colour black for the negative polarity, unless the polarity is irrelevant.~~ symbols. The positive terminal shall be indicated by symbol IEC 60417-5005 (2002-10) and the negative terminal by symbol IEC 60417-5006 (2002-10).
7.102DV		~~D1 Addition – National Difference in Canada and the U.S.:~~ D1 Addition of Clauses 7.102DV.1 and 7.102DV.2 to the Part 2:
7.103DV		D1 Addition of the following to the Part 2: A child entrapment warning statement shall be included in either the operating instructions or in a use and care manual provided with each refrigerator and shall include the following or equivalent wording: DANGER: Risk of child entrapment. Before you throw away your old refrigerator or freezer: * Take off the doors. * Leave the shelves in place so that children may not easily climb inside.
10.103DV		~~D2 Addition – National Difference in Canada, Mexico, and the U.S.:~~ DR Addition of Clauses 10.103DV.1 and 10.103DV.2 to the Part 2:
11	Info	**Heating**
11.1DV		~~D2 Modification – National Difference in Canada, Mexico, and the U.S.:~~ D2 Modification of Clause 11.1 of the Part 2 by adding the following after the last sentence: Winding temperatures of motor compressors are not required to be measured when the case housing temperature (with a thermocouple at the most unfavourable location) does not exceed 150°C (302°F). ~~NOTE – 11.1DV.1 applies to the U.S. and Canada only.~~
11.8		Addition: For motor-compressors not conforming to IEC 60335-2-34 (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. For motor-compressors conforming to IEC 60335-2-34 (including its Annex AA), the temperatures of their – housings of motor-compressors, – windings of motor-compressors and

		– other parts such as its protection system and control system, and all other components that have been tested together with the motor-compressor during the tests of IEC 60335-2-34 and its Annex AA are not measured. The entry in Table 3 relating to the temperature rise of the external enclosure of MOTOR-OPERATED APPLIANCES is applicable to all appliances covered by this standard. However, it is not applicable to those parts of the external enclosure of the appliance that are, – for BUILT-IN APPLIANCES, not ACCESSIBLE PARTS after installation in accordance with the instructions for installation; – for other appliances, on that part of the appliance that according to the instructions for installation is intended to be placed against a wall with a free distance not exceeding 75 mm. ~~Temperatures of~~ ~~– enclosures of motor-compressors other than those with an enclosure for which the temperature rise is specified in Table 3;~~ ~~– windings of motor-compressors;~~ ~~shall not exceed the values given in Table 101.~~ ~~For motor-compressors complying with IEC 60335-2-34 (including its annex AA), the temperatures of their~~ ~~– enclosures, other than those with an enclosure for which the temperature rise is specified in~~ ~~Table 3;~~ ~~– windings and other parts;~~ ~~are not measured.~~
11.8DV		~~D2 Modification – National Difference in Mexico and the U.S.:~~ D2 Modification of Clause 11.8 of the Part 2 by replacing the sixth paragraph with the following: Temperature rises shall not exceed the values given in Table 3 of the Part 1 reduced by 7 K.
13	Info	**Leakage current and electric strength at operating temperature**
13.3		Addition: The test voltage specified in Table 4 for REINFORCED INSULATION is applied between separate circuits for battery operation and mains supply operation.
15	Info	**Moisture resistance**
15.106DV		~~D1 Addition – National Difference in Canada, Mexico, and the U.S.:~~ D1 Addition of Clause 15.106DV.1 to the Part 2:
15.107DV		D1 Addition of Clause 15.107DV.1 to the Part 2:
15.107DV.1		Overflow test
15.107DV.1.1		Condensate disposal means, such as a pan, trough, or the like, shall be constructed and located so that overflow will not wet uninsulated LIVE PARTS or result in a

		reduction of CLEARANCES and CREEPAGE DISTANCES.
15.107DV.1.2		With reference to Clause 15.107DV.1.1, compliance is checked by the following test. The condensate disposal means, such as a pan, trough, or the like, shall be overflowed at a rate of 30 ml/s for a minimum of 30 s.
15.107DV.1.3		Immediately after the test in Clause 15.107DV.1.2, the appliance shall withstand the electric strength test of Clause 16.3, and inspection shall show that there is no trace of water on insulation which could result in a reduction of CLEARANCES and CREEPAGE DISTANCES below the values specified in Clause 29.
15.107DV.1.4		For appliances which are directly connected to the water supply, a blocked drain shall not result in the wetting of uninsulated LIVE PARTS or in a reduction of CLEARANCES and CREEPAGE DISTANCES.
15.107DV.1.5		With reference to Clause 15.107DV.1.4, compliance is checked by the following test. The drain shall be blocked and be overflowed at a rate of 30 ml/s (1,0 oz/s) for a minimum of 30 s.
15.107DV.1.6		Immediately after the test in Clause 15.107DV.1.5, the appliance shall withstand the electric strength test of Clause 16.3, and inspection shall show that there is no trace of water on insulation which could result in a reduction of CLEARANCES and CREEPAGE DISTANCES below the values specified in Clause 29.
15.107DV.1.7		For appliances which are directly connected to the water supply, any leakage from a water line connection shall not result in the wetting of uninsulated LIVE PARTS or in a reduction of CLEARANCES and CREEPAGE DISTANCES.
15.107DV.1.8		With reference to Clause 15.107DV.1.7, compliance is checked by the following test. The water line connections shall be fully and/or partially disconnected such that the leakage is directed toward electrical components. Flow water through the water tubing for a minimum of 5 min. Water pressure shall be maintained at a gauge pressure of 275 kPa – 415 kPa (40 psi – 60 psi).
15.107DV.1.9		Immediately after the test in Clause 15.107DV.1.8, the appliance shall withstand the electric strength test of Clause 16.3, and inspection shall show that there is no trace of water on insulation which could result in a reduction of CLEARANCES and CREEPAGE DISTANCES below the values specified in Clause 29.
19	Info	**Abnormal operation**
19.104		Illuminating equipment shall not cause a hazard under abnormal operating conditions. Compliance is checked by the following test, for which the appliance is empty, the refrigerating system is switched off or rendered inoperative, with the lamp circuit remaining operable, and doors or lids are in the most unfavourable open position or closed, whichever is the more onerous. The complete illuminating equipment including its protective cover, fitted with a lamp as recommended by the manufacturer, is operated for 12 h at 1,06 times the RATED VOLTAGE. If an incandescent lamp does not attain the maximum rated wattage at RATED VOLTAGE, the voltage is varied until the maximum rated wattage is reached and is then increased to 1,06 times this voltage.

	Illuminating equipment having discharge lamps is operated under the fault conditions specified in items a), d) and e) of 12.5.1 of IEC 60598-1, the appliance being supplied at RATED VOLTAGE until temperature stabilization of the measured parts. During and after the test, the appliance shall comply with 19.13.
20	**Stability and mechanical hazards**
20.2DV.1	D1 Modification of Clause 20.2 of the Part 1 to add the following after the first paragraph: Clause 101.DVA.1 of Annex 101.DVA shall be applied for assessment of mechanical hazards.
20.2DV.2	D1 Modification of Clause 20.2 of the Part 1 to add the following after the fourth paragraph: For openings with a minor dimension equal to or greater than 34,9 mm (1-3/8 in), compliance shall be checked by inspection and by applying the test probes of Annex 101.DVA with a force of 11,1 N (2,5 lb). The probes shall be rotated or angled to any possible position before, during, or after insertion through the opening, and if necessary, the probe configuration shall be changed after the probe has been inserted through the opening.
20.101DV	D1 Modification of Clauses 20.101 – 20.104 by replacing them with Clauses 20.101DV.1 and 20.101DV.2:
20.101DV.1	A refrigerator shall be stable when tested in accordance with Clause 20.101DV.2. This requirement does not apply to BUILT-IN APPLIANCES and refrigerators where both the width and depth dimensions of the supporting base are greater than the height of the refrigerator.
20.101DV.2	The refrigerator shall be supported by the legs, leveling screws, rollers, or the like, provided in the base of the unit, and installed in accordance with the manufacturer's instructions. Plumbing or conduit connections shall not be relied on for the purpose of the test. The refrigerator shall not overturn under the conditions specified in items (a) and (b): a) An empty refrigerator, with doors, covers, and panels closed, shall be placed on a plane surface inclined at an angle of 10° from the horizontal. Accessories that are intended for use with the refrigerator shall be installed. Swivel-type casters, if any, shall be oriented so that the tendency to overturn is maximum. The refrigerator shall be restrained if necessary to prevent it from sliding or rolling. Or an empty refrigerator, with accessories installed, that has a mass of 22,7 kg (50 lbs) or more shall be placed on a horizontal surface. If leveling screws are provided, they shall be adjusted equally to raise the refrigerator to the maximum adjustable level, but not more than 25,4 mm (1 in) above floor level. The refrigerator shall be restrained, if necessary, to prevent it from sliding or rolling. The refrigerator shall be loaded with one-third of the total food-storage load determined in accordance with Clause 21.103DV.1.6. This load shall be distributed over each food-supporting component and located approximately at the center of the component. If swivel-type casters are provided, they shall be oriented so that the tendency to overturn

	is maximum. All doors shall be closed. A force equal to one-fifth the weight of the empty refrigerator, but not more than 222,5 N (50 lbf) shall be applied horizontally at the vertical centerline of any side of the refrigerator at the highest point, not to exceed 1,5 m (5 ft) above floor level; and b) An empty refrigerator, with accessories installed, that has a mass of 22,7 kg (50 lbs) or more shall be placed on a horizontal surface. If leveling screws are provided, they shall be adjusted equally to raise the refrigerator to the maximum adjustable level, but not more than 25,4 mm (1 in) above floor level. The refrigerator shall be restrained, if necessary, to prevent it from sliding or rolling. The refrigerator shall be loaded with one-third of the total food-storage load determined in accordance with Clause 21.103DV.1.6. This load shall be distributed over each food-supporting component and located approximately at the center of the component. If swivel-type casters are provided, they shall be oriented so that the tendency to overturn is maximum. A force equal to one-fifth the weight of the empty refrigerator, but not more than 222,5 N (50 lbf), shall be applied vertically downward at the edge of the widest exterior door farthest from the hinges, with the door opened at an angle of 90° to the cabinet. All other doors shall be closed. Shelves, drawers, and other food storage components shall be in their normal storage position. This test shall not be conducted on chest-type units.
20.102	Appliances provided with doors shall be subjected to the following test. Unless otherwise specified in this standard, all door shelves, other than those which are specifically designed for storing eggs, shall be loaded using cylindrical weights having a diameter of 80 mm and a mass of 0,5 kg. NOTE 1: If egg racks can be removed, the relevant shelf is not considered to be specifically designed for storing eggs. As many ~~The~~ weights as possible are placed horizontally on the door shelves starting as far as possible from the hinge and touching each other along the shelf, even if extended beyond the edge of the shelf, except for a space less than 80 mm wide at the end of the shelf. ~~Two~~ Three of these weights are placed in each position on those shelves where a container with a the free height ~~of 170 mm can be~~ above the shelf is 340 mm or higher, two weights in each position ~~is used~~ on ~~the other~~ those shelves where the free height above the shelf is between 170 mm and 340 mm and one weight in each position where the free height above the shelf is less than 170 mm. Shelves that can be adjusted to ~~be loaded~~ different positions by the user are placed in the position which will give the most unfavourable results. NOTE 2: If the shelf is too narrow to accommodate the weights lying flat, the weights may overhang the shelf or be tipped up. Liquid containers located on the door are filled with a quantity of water to their full mark or, in the absence of a full mark, are completely filled. For appliances with only one door, this is opened through an angle of approximately 90° and a weight of 2,3 kg is placed 40 mm from the edge farthest

		from the hinge on top of the door. For appliances with more than one door, any two doors, in the most unfavourable combination, are opened through an angle of approximately 90°. The shelves of closed doors are not loaded. A weight of 2,3 kg is placed 40 mm from the edge farthest from the hinge on top of one of the open doors, chosen so as to give the most onerous test conditions. The test is repeated with the door or doors opened through an angle of approximately 180° or to the limit of the door stop, whichever results in the smaller angle of opening. Where appliances are provided with reversible doors, the test with the doors open to 180° or to the limit of the door stop, is repeated with the doors hinged on the other side in accordance with the instructions, if this will give a more unfavourable result.
20.105DV		~~D1 Addition – National Difference in Canada and the U.S.:~~ D1 Addition of the following to the Part 2: Ice dispensers shall be designed and constructed such that in normal use pieces are not broken off and dispensed along with the ice. Compliance shall be checked by the tests of Annex 101.DVB.
20.106DV		D1 Addition of the following to the Part 2: Horizontally-hinged doors that provide access to the food storage compartment(s) of chest-type units shall be counterweighted, spring loaded, or provided with an automatic latch to retain them in the open position. Action members, such as springs and latches, shall be enclosed or guarded.
20.107DV		D1 Addition of the following to the Part 2: The hinges of a horizontally swinging exterior refrigerator door shall not separate from the cabinet or door when tested in accordance with Annex 101.DVC.
21	Info	**Mechanical strength**
21DV.2.1		D1 Modification of Clause 21.1DV.2 of the Part 1 by adding the following: The impact energy shall be 6,8 J (5 ft·lbf) for enclosures of uninsulated LIVE PARTS that are not protected within the confines of the refrigerator.
21DV.2.2		D1 Modification of Clause 21.1DV.2 of the Part 1 by adding the following: For nonmetallic enclosures used within a freezer compartment, samples shall be subjected to a temperature of minus 18 °C ± 1,4 °C (0 ± 2,5 °F) for a period of 3 h and impacted while still cold.
21.103DV		~~D1 Addition – National Difference in Canada and the U.S:~~ D1 Addition of Clause 21.103DV.1 to the Part 2:
21.103DV.1.2		This requirement does not apply to refrigerators having a storage capacity of 60 l (2,1 ft3) or less.
21.103DV.1.9		The tests in Clauses 21.103DV.1.1 and 21.103DV.1.5 shall be conducted with the most unfavorable arrangement or removal of food-storage components. Any

		food-storage component or its structural support parts that are located in a freezer compartment and constructed of polymeric materials shall be subjected to a temperature of minus 18 °C ± 1,4 °C (0 ± 2,5 °F) for a period of 24 h and tested while still cold.
21.104DV.1.1		A slide-out food storage component shall be retained by its supporting means when a horizontal pull force ~~of 1/3~~ equal to the ~~shelf load test~~ weight ~~as described~~ of the component loaded in accordance with Clause 21.103DV.1.6 and not greater than 133 N (30 lbs) force is applied at the center of the leading edge. The food storage component shall be loaded in accordance with Clause 21.103DV.1.6 during this test.
21.104DV.1.2		The types of components specified in (a) – (e) need not be restrained: a) A pan, tray, or similar container that rests freely on a shelf or on the storage compartment bottom; b) a component that when loaded as specified in Clause 21.103DV.1.6 has a mass not exceeding 4,5 kg (10 lbs); c) A shelf or container located so that the bottom of the shelf or container is not more than 508 mm (20 in) above the floor, with levelers, if provided, adjusted to raise the refrigerator to its maximum elevation above the floor but not more than 25,4 mm (1 in); d) A condensate tray not exceeding a 76,2-mm (3-in) depth or not intended for food storage; and e) Food storage components in refrigerators having a storage capacity of 60 l (2,1 ft3) or less.
22	Info	**Construction**

22.101	Lampholders shall be fixed so that they do not work loose in normal use. NOTE: Normal use includes replacement of lamps. Compliance is checked by inspection and, if necessary, by subjecting the lampholders to a torque of 0,15 Nm for E14 and B15 lampholders, and 0,25 Nm for E27 and B22 lampholders. The lampholders shall then withstand a push force and then a pull force of 10 N ± 1 N, each applied for 1 min in the direction of the axis of the lampholder. After the tests, lampholders shall not have worked loose. Lampholders for a fluorescent lamp shall comply with the test of 4.4.4 i) in IEC 60598-1.
22.101DV.1	~~D1 Modification – National Difference in Canada, Mexico, and the U.S.:~~ ~~For lampholders dimensionally smaller than B15, compliance is checked by inspection and, if necessary, by subjecting the lampholders to a torque of 0,15 Nm. For all other sizes, a torque of 0,25 Nm shall apply. The lampholders shall then withstand a push force and then a pull force of 10 N ±1 N, each applied for 1 min in the direction of the axis of the lampholder.~~ DC Modification of Clause 22.101 of the Part 2 by adding the following at the end of the second paragraph: E12 and E17 lamp holders are checked as specified for E14 and B15 lamp holders. E26 lamp holders are checked as specified for E27 and B22 lamp holders.
22.101DV.2	~~D1 Modification – National Difference in Canada and the U.S.:~~ D1 Modification of Clause 22.101 of the Part 2 by adding the following after the last sentence: For appliances rated at 150 V or less, a lampholder with a screw-shell base shall be wired so that the screw-shell is connected to the grounded (identified) conductor of the power supply circuit.
22.102DV	~~D1 Modification – National Difference in Canada and the U.S.:~~ D1 Modification of Clause 22.102 of the Part 2 by adding Clauses 22.102DV.1 and 22.102DV.2 after the last sentence:
22.102DV.1	~~Insulation resistance test~~ Compliance with Clause 22.102 shall also be checked by cycling the heater assembly or terminal seal in an atmosphere of not less than 98% relative humidity at any convenient temperature above 0 °C (32 °F). The heater shall be energized at its RATED VOLTAGE and operated for 1 000 cycles at a rate of 1,5 min on and 13,5 min off.
22.102DV.2	Immediately after the test, the heater assembly shall withstand the electric strength test of Clause 16.3.
22.103	~~ICE-MAKERS and appliances incorporating ICE-MAKERS shall withstand the water pressure to which they may be subjected in normal use.~~ ~~Compliance is checked by subjecting those parts of the ICE-MAKER and of the appliance incorporating an ICE-MAKER, which are under pressure from the water~~

~~supply mains, for 5 min, to a static pressure equal to twice the maximum permissible inlet water pressure or 1,2 MPa (12 bar), whichever is the greater. During the test, there shall be no leakage from any part including the inlet water hose.~~

Appliances employing a TRANSCRITICAL REFRIGERATION SYSTEM shall in the high pressure side of the refrigeration system include a PRESSURE RELIEF DEVICE on the compressor or between the compressor and the GAS COOLER. There shall be no shut off devices or other components except piping between the compressor and the PRESSURE RELIEF DEVICE, which could introduce a pressure drop.

The PRESSURE RELIEF DEVICE shall be mounted so that the refrigerant released from the system cannot cause any harm to the user of the appliance. The aperture shall be located so that it is unlikely to be obstructed in normal use.

The PRESSURE RELIEF DEVICE shall have no provisions for setting by the end user. The operating pressure of the PRESSURE RELIEF DEVICE shall be no higher than the DESIGN PRESSURE of the high pressure side.

The DESIGN PRESSURE of the high pressure side shall be not less than the minimum high side test pressure required in Table 101 of IEC 60335-2-34 divided by 3.

The refrigeration system, including all components, shall withstand the pressures expected in normal and abnormal use and during standstill.

Pressure testing has to be done on the complete refrigeration system, however it can be done separately for the low pressure side and for the high pressure side.

Compliance is checked by inspection and by the following test:

The PRESSURE RELIEF DEVICE is made inoperable and the test pressure is raised gradually
– for the high pressure side, until a pressure not less than the minimum high side test pressure required in Table 101 of IEC 60335-2-34 is reached, however not less than 3 times the DESIGN PRESSURE;
– for the low pressure side, until a pressure not less than the minimum low side test pressure required in Table 102 of IEC 60335-2-34 is reached.

For a refrigeration system with an intermediate pressure between high pressure side and low pressure side, all parts subjected to the intermediate pressure are considered to be on the low pressure side.

The pressure is maintained for one minute and the parts under test shall show no leakage.

NOTE: The test is not carried out on motor-compressors complying with IEC

	60335-2-34.
22.107.1	A leakage is simulated at the most critical point of the cooling system. For refrigerant circuits that do not meet the corrosion requirements of 22.107.3 a leak is also simulated at any point of the cooling circuit that is nearest to an entry of a pipe or cable into a food storage compartment. The concentration of leaked refrigerant is measured ~~continuously~~ at least every 30 s from the beginning of the test and for at least ~~1~~ 24 h after injection of the gas has stopped, inside and outside the food storage compartment, as close as possible to electrical components which, during NORMAL OPERATION, or abnormal operation, produce sparks or arcs. The concentration is not measured close to – NON-SELF-RESETTING PROTECTIVE DEVICES necessary for compliance with Clause 19 even if they produce arcs or sparks during operation; – INTENTIONALLY WEAK PARTS that become permanently open-circuited during the tests of Clause 19 even if they produce arcs or sparks during operation; – electrical apparatus that has been tested and found to comply with at least ~~IEC 60079-15:1987, Clause 16, in the case of luminaires~~ the requirements in Annex CC. ~~– IEC 60079-15:1987, section 4, in the case of group IIA gases or the refrigerant used, if this electrical apparatus produces arcs or sparks during operation.~~
22.107.3	If aluminium having a purity of less than 99,5 % according to ISO 209 is used in a protected cooling system that is embedded in thermal insulation, a sample of the cooling system is subjected to the salt mist test of IEC 60068-2-11 for a test duration of 48 h. After the test there shall be no sign of blistering, pitting or other active corrosion of the aluminium or its coating, if any. NOTE: Aluminium with an ISO designation of Al 99,5 or an international registration record of 1050 A has a purity of 99,5 %.
22.108	Refrigerant leakage into food storage compartments shall not result in an explosive atmosphere outside the food storage compartments in areas where electrical components that produce arcs and sparks during NORMAL OPERATION or abnormal operation or luminaires are mounted, when doors or lids remain closed or when opening or closing doors or lids, unless these components have been tested and found at least to comply with I~~EC 60079-15:1987, Section 4~~ the requirements in Annex CC, for group IIA gases or the refrigerant used.

22.109	Compliance is checked by the following test, unless luminaires and components that produce arcs or sparks during NORMAL OPERATION or abnormal operation, and which are mounted in the areas under consideration, have been tested and found at least to comply with ~~IEC 60079-15:1987, Section 4~~ the requirements in Annex CC for group IIA gases or the refrigerant used.
22.111	In COMPRESSION-TYPE APPLIANCES which use FLAMMABLE REFRIGERANT in their cooling system, all possible inadvertent contact points between uncoated aluminium and copper pipes or similar dissimilar metals shall be prevented from galvanic coupling by positive means such as the use of insulated sleeving or spacers. Compliance is checked by inspection.
22.112DV	DR Modification of Clause 22.112 of the Part 2 to replace paragraphs three through six and the notes with Clause 22.112DV.1:
22.114DV	D1 Modification of Clause 22.114 of the Part 2 by adding the following: A refrigerator or combination refrigerator-freezer drawer shall be subjected to 300 000 cycles of drawer operation. A freezer drawer shall be subjected to 150 000 cycles of operation. The drawer shall be opened sufficiently on each cycle to provide a complete cycle of operation of the latch mechanism. At the conclusion of this test, the latch release device shall comply with the requirements of Clause 22.114.
22.115DV	D1 Modification of Clause 22.115 of the Part 2 by replacing the second paragraph and the Note with Clauses 22.115DV.1 and 22.115DV.2:
22.115DV.1	The key slot of a key operated lock shall be spring loaded or equivalent so that the key must be manually held in the lock in any position of the lock. The key slot shall be marked as indicated in Clause 7.102DV.2.
22.115DV.2	The key of a key operated lock shall be permanently marked as indicated in Clause 7.102DV.1.
22.116	ACCESSIBLE GLASS PANELS with an area having any two orthogonal dimensions exceeding 75 mm shall be either made from glass that shatters into small pieces when broken or be made from glass that has enhanced mechanical strength. NOTE 1: External door finishes made of glass that are covered by a transparent adhesive covering are considered to be ACCESSIBLE. For ACCESSIBLE GLASS PANELS made from glass that shatters into small pieces when broken, 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 2: 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 and a semi-circular area having a radius of 100 mm from the point of impact. 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 crackfree particles within the mask are counted and for each assessment shall not be less than 40. NOTE 3: In the case of curved glass, plane pieces of the same material can be used for the test. For ACCESSIBLE GLASS PANELs made from glass that has enhanced mechanical strength, compliance is checked by the pendulum hammer test Eha of IEC 60068-2-75. For the test the glass panels are supported according to their method of incorporation in the appliance. The test is performed with three blows applied at the most critical point on two samples, the impact energy of each blow shall be 5 J. At the conclusion of the tests the glass shall not be broken or cracked.
22.116DV		D2 Modification of Clause 22.116 of the Part 2 by adding the following: If the ACCESSIBLE GLASS PANELS comply with ANSI Z97.1, then Clause 22.116 does not apply.
22.117DV		~~D2 Addition – National Difference in Canada and the U.S.:~~ D2 Addition of Clause 22.117DV.1 to the Part 2:
22.118DV		D2 Addition of Clauses 22.118DV.1 and 22.118DV.2 to the Part 2:
22.118DV.1		Compression-type appliances which use flammable refrigerants shall not be constructed with refrigerant tubing on the exterior of the refrigerator such that it could be grasped or handled during moving of the appliance.
22.118DV.2		All joints in a refrigeration system containing a FLAMMABLE REFRIGERANT shall be brazed or welded. Joining methods other than brazing or welding that have been evaluated with respect to corrosion resistance, mechanical stress, leak rates, and similar methods shall be considered to comply.
23	Info	**Internal Wiring**

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 for conductors flexed during normal use is increased to 100 000. Addition:
23.3DV		D1 Modification to replace the second paragraph of Clause 23.3 of the Part 2 with the following: The number of flexings for conductors flexed during normal use is increased to 150 000 for each freezer door/drawer and 300 000 for each refrigerator door/drawer. The rate of flexing shall be consistent with normal use.
24	Info	**Components**
24.1.4		Addition: – SELF-RESETTING THERMAL CUT-OUTS which may influence the test results of 19.101 and which are not short-circuited during the test of 19.101 - 100 000 – THERMOSTATS which control the motor-compressor - 100 000 – motor-compressor starting relays - 100 000 – automatic thermal motor-protectors for motor-compressors of the hermetic and the hermetic and semi-hermetic type - minimum 2 000, but not less than the number of operations during the 15-day locked rotor test, whichever is the greater – manual reset thermal motor-protectors for motor-compressors of the hermetic and semi-hermetic type - 50 – other automatic thermal motor-protectors except for fan motors - 2 000 – other manual reset thermal motor protectors - 30 – for pressure relief devices of the bursting disc type, three separate samples of the appropriate parts of the refrigeration system are tested and the bursting disc shall operate in the same way for each sample tested - 1 – electrical pressure relief devices • for automatic operation: - 30 000 • for manual reset - 300 ELECTRICAL PRESSURE RELIEF DEVICES shall comply with IEC 60730-2-6 and – shall be of type 2B and type 2N; – shall have a trip free mechanism of type 2E; – the deviation and drift shall not exceed + 0%. For MECHANICAL PRESSURE RELIEF DEVICES not falling under the scope of IEC 60730 the operating pressure must be no more than the setting of the device plus 10 %. PRESSURE RELIEF DEVICES of the BURSTING DISC type that are not certified to ISO 4126-2 shall be tested as part of the appliance to 14.3.4 of ISO 4126-2. They shall be marked with – name, trademark or identification mark of the manufacturer or responsible vendor;

		– model name or type reference.
24.1.4DV		D1 Modification of Clause 24.1.4 of the Part 2 to add the following before the dashed items: The number of cycles of operation declared for 6.10 and 6.11 of IEC 60730-1 shall not be less than the following:
24.104DV		D1 Add the following to the Part 2: The appliance shall be designed so that the field installation of ACCESSORIES shall: a) Be by the means of receptacles, plug-in connectors, wiring terminals, or insulated wire connectors; b) Not require drilling, cutting, soldering, or rearrangement of existing components; c) Prevent stress from being transmitted to the appliance wiring or terminals; and d) Reduce the likelihood that the auxiliary device will be incorrectly installed.
24.105DV		DR Add Clauses 24.105DV.1 – 24.105DV.3 to the Part 2:
24.105DV.1		Motor running capacitors in appliances for which Clause 30.2.3 is applicable and that are permanently connected in series with a motor winding shall not cause a hazard in the event of a capacitor failure.
24.105DV.2		With reference to Clause 24.105DV.1, the requirement is considered to be met if the capacitors are of class of safety protection S2 or S3 according to IEC 60252-1 or are marked ”Internally Protected” or ”Protected” according to UL 810.
24.105DV.3		With reference to Clause 24.105DV.2, compliance shall be checked by inspection.
25	Info	**Supply connection and external flexible cords**
25.7		Modification: ~~Replace the fourth and fifth dashed items by the following:~~ ~~– light polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 52).~~ Light polyvinyl chloride sheathed cord (code designation 60227 IEC 52) and heat-resistant light polyvinyl chloride sheathed cord (code designation 60227 IEC 56) are allowed regardless of the mass of the appliance. Addition: This subclause does not apply to flexible leads or cords used to connect an appliance to a SELV power supply.
25.102DV		~~D1 Addition – National Difference in Mexico, Canada, and the U.S.:~~ DR Addition of Clauses 25.102DV.1 and 25.102DV.2 to the Part 2:
27	Info	**Provision for earthing**

27.1DV		~~D2 Modification – National Difference in Canada and the U.S.:~~ D2 Modification of Clause 27.1 of the Part 1 as follows: In the first paragraph, replace "ACCESSIBLE METAL PARTS" with "ACCESSIBLE METAL PARTS and metal parts that are capable of being contacted by service personnel while the refrigerator is energized."
27.5DV.3		DR Modification to replace 27.5DV.1, 27.5DV.2, and Table 27.5DV of the Part 1 with the following: The requirements of Clause 27.5 apply, except that the test duration shall be 2 minutes.
28		**Screws and connections**
28.101DV		D1 Add Clauses 28.101DV.1 – 28.101DV.3 to the Part 2 (US only):
30	Info	**Resistance to heat and fire**
30.101DV		D1 Add the following to Clause 30 of the Part 2: Appliances must comply with the additional requirements of Annex 101.DVD.
Annex CC	Info	**Non-sparking "n" electrical apparatus**
Annex CC 11		**Supplementary requirements for non-sparking luminaires** All of the subclauses of Clause 11 are applicable, except 11.2.4.1, 11.2.4.5, 11.2.5, 11.2.6, 11.2.7, 11.3.4, 11.3.5, 11.3.6 and 11.4.
Annex CC 16		**General supplementary requirements for apparatus producing arcs, sparks or hot surfaces** Clause 16 is applicable.
Annex CC 17		**Supplementary requirements for enclosed-break devices and non-incendive components producing arcs, sparks or hot surfaces** Clause 17 is applicable.
Annex CC 18		**Supplementary requirements for hermetically sealed devices producing arcs, sparks or hot surfaces** Clause 18 is applicable.
Annex CC 19		**Supplementary requirements for sealed devices producing arcs, sparks or hot surfaces** All of the subclauses of Clause 19 are applicable, except 19.1 and 19.6, which are replaced by the following.
Annex CC 19.1		**Non-metallic materials** Seals are tested using 22.5. However, if the device is tested in the appliance, then 22.5.1 and 22.5.2 are not applicable. After the tests of Clause 19 in IEC 60335-2-24, by inspection, no damage that could impair the type of protection shall be evident.
Annex CC 19.6		**Type tests** The type tests described in 22.5 shall be performed where relevant.

Annex CC 20	**Supplementary requirements for restricted-breathing enclosures protecting apparatus producing arcs, sparks or hot surfaces** Clause 20 is applicable.
Annex DVA	***New annex added;*** **Component Standards Cross Reference**
Annex 101.DVA	***New annex added;*** **Hazard Assessment for Moving Parts; and Probes to Simulate Access to Hazardous Parts by Children**
Annex 101.DVB	***New annex added;*** **Ice Dispenser Durability**
Annex 101.DVC	***New annex added;*** **Door Hinge Strength Test**
Annex 101.DVD	***New annex added;*** **Resistance to Heat and Fire**
	CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.