

## STANDARD INFORMATION

**Standard:** UL 60335-2-24 / CSA C22.2 No. 60335-2-24

**Standard ID:**

Safety Requirements for Household and Similar Electrical Appliances - Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers [UL 60335-2-24:2017 Ed.2+R:27Feb2020]

Household and Similar Electrical Appliances – Safety – Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-cream Appliances and Ice-makers [CSA C22.2#60335-2-24:2017 Ed.2+U1;U2]

**Previous Standard ID:**

Safety Requirements for Household and Similar Electrical Appliances - Part 2: Particular Requirements for Refrigerating Appliances, Ice-Cream Appliances and Ice-Makers [UL 60335-2-24:2017 Ed.2+R:22May2019]

Household and Similar Electrical Appliances – Safety – Part 2-24: Particular Requirements for Refrigerating Appliances, Ice-cream Appliances and Ice-makers [CSA C22.2#60335-2-24:2017 Ed.2+U1]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **February 28, 2024**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn

**Overview of Changes:**

- Added classification requirements of at least IPX4 for outdoor use.
- Revision to marking requirement when flammable refrigerant is used.
- Added marking requirement for outdoor use.
- Added installation instruction for accessories.
- Revision to refrigerant tubing on a refrigerator employing a flammable refrigerant.
- Revision to supply cords used on an appliance intended for outdoor use.

Specific details of new/revise requirements are found in table below



**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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</i>
6	Info	<b>Classification</b> <b><i>New clause added;</i></b>
6.2DV D2		Appliances or parts of appliances intended for outdoor use shall meet the requirements of at least IPX4.
7	Info	<b>Marking and instructions</b>
		The following markings, or the equivalent, shall be provided and shall be permanent when a FLAMMABLE REFRIGERANT is used:  a) <u>"DANGER – Risk Of fire or explosion. Flammable refrigerant used. Do not use mechanical devices to defrost refrigerator. Do not puncture refrigerant tubing."</u> <u>This marking shall be located on or near any evaporator that can be contacted by the user.</u> b) <u>"DANGER – Risk of fire or explosion. Flammable refrigerant used. To be repaired only by trained service personnel. Use only manufacturer-authorized service parts. Any repair equipment used must be designed for flammable refrigerants. Follow all manufacturer repair instructions. Do not puncture refrigerant tubing."</u> This marking shall be located near the machine compartment. c) <u>"CAUTION – Risk of fire or explosion. Dispose of refrigerator properly in accordance with the applicable federal or local regulations. Flammable refrigerant used."</u> This marking shall be located on the exterior of the refrigerator. d) <u>"CAUTION – Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully. Flammable refrigerat used."</u> This marking shall be located near all exposed refrigerant tubing.
7.1DV.4.1		
7.1DV.4.3		The markings of Clause 7.1DV.4.1 shall be in letters no less than 3,2-mm (1/8-in) high, <u>except for the signal words, "DANGER", "WARNING", and "CAUTION", which shall be no less than 5,0 mm (0,2 in) high and shall be in all capital letters.</u>



CLAUSE	VERDICT	COMMENT
7.1DV.4.4		<p>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. 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. <u>The requirement for color marking is waived if the markings of clause 7.1DV.4.1 b) along with the symbol ISO 7010 W021 are visible while gaining access to the process tube.</u></p>
		<p><b><i>New clause added;</i></b></p>
7.1DV.7 D2		<p>Appliances intended for outdoor use shall be marked with “Suitable for Outdoor Use”.</p>
		<p><b><i>New clause added;</i></b></p>
7.12.1DV D2		<p>Accessories that involve the modification of or addition of electrical components to circuits not powered by a LIMITED POWER SOURCE shall be provided with installation instructions for installing line-voltage electrical accessories. These instructions shall be provided on or with each accessory. A statement shall be included in the instructions warning the installer that the refrigerator must be disconnected from the source of electrical supply before attempting the installation. The instructions shall also include information regarding the refrigerators the accessory is designed to be used with.</p>
22	Info	<p><b>Construction</b></p>
		<p><b><i>New clause added;</i></b></p>
22.118DV.1		<p>Refrigerant tubing on a refrigerator employing a flammable refrigerant shall be protected or enclosed to avoid mechanical damage and damage that could occur during moving of the product.</p>
		<p><b><i>New clause added;</i></b></p>
22.118DV.1.1		<p>Refrigerant tubing located within the confines of the cabinet and tubing that does not protrude from the compressor compartment are considered to be protected from mechanical damage.</p>
		<p><b><i>New clause added;</i></b></p>
22.118DV.1.2		<p>A static condenser coil mounted on the outside of a refrigerator is considered to be protected against mechanical damage if it complies with all of the following:</p> <ul style="list-style-type: none"><li>– The return bends of the condenser are covered such that they cannot be grasped or handled during moving of the product. The return bends are</li></ul>



CLAUSE	VERDICT	COMMENT
		<p>considered to be adequately covered if they cannot be grasped with test probe B applied with a force of 20 N.</p> <ul style="list-style-type: none"> <li>– The other edges of the condenser are covered or secured to prevent damage during moving of the product. They are considered adequately secured if they meet the pull force requirements of clause 22.11 without deformation of the tubing or loosening of the condenser from the refrigerator.</li> <li>– All other tubing in the condenser is adequately protected by the fill wire. The tubing is considered adequately protected if any single tube cannot be grasped with test probe B applied with a force of 20 N.</li> </ul>
		<b><i>New clause added;</i></b>
22.118DV.1.3		<p>A static evaporator coil mounted as shelving on the inside of a food storage compartment is considered to be protected against mechanical damage if it complies with all of the following:</p> <ul style="list-style-type: none"> <li>– The shelf shall comply with clauses 22.11, 21.103DV.1.1, 21.103DV.1.6 and 21.104DV.1 with no permanent deformation or damage resulting in a refrigerant leak, kinked refrigerant tubing, or loosening of the tubing from the refrigerator.</li> <li>– The tubing shall comply with the scratch test of Clause 22.107.2.</li> </ul>
		<b><i>New clause added;</i></b>
22.118DV.2		<p>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.</p>
25	Info	<b>Supply connection and external flexible cords</b>
		<b><i>New clause added;</i></b>
25.7DV.2		<p>A SUPPLY CORD used on an appliance intended for outdoor use shall comply with the requirements for outdoor-use cord sets in accordance with UL 817 and CSA C22.2 No. 21. Such cords are identified by the letters “W” or “W-A” following the cord type designation marked on the jacket.</p>
31	Info	<b>Resistance to rusting</b>
		<b><i>New clause added;</i></b>
31.101DV D2		<p>If an appliance is intended for outdoor use, sheet steel structural parts such as cabinets and enclosures shall be protected from corrosion.</p> <p>Compliance shall be checked by the salt mist test of IEC 60068-2-52, severity 2 being applicable.</p>



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		<p>Before the test, coatings shall be scratched by means of a hardened steel pin, the end of which has the form of a cone with an angle of 40°. Its tip shall be rounded with a radius of 0,25 mm ±0,02 mm (0,0098 in ± 0,00078 in). The pin shall be loaded so that the force exerted along its axis is 10 N ±0,5 N. The scratches shall be made by drawing the pin along the surface of the coating at a speed of approximately 20 mm/s (0,087 in/s). Five scratches shall be made at least 5 mm (0,196 in) apart and at least 5 mm (0,196 in) from the edges.</p> <p>After the salt mist test, the appliance shall not have deteriorated to such an extent that compliance with this standard, in particular with Clauses 8 and 27, is impaired. The coating shall not be broken and shall not have loosened from the metal surface.</p>
		<p><b><i>New clause added;</i></b></p>
31.101DV.2		<p>As an alternative to Clause 31.101DV.1, sheet steel structural parts, such as cabinets and enclosures that are intended for outdoor use, may be protected against corrosion with a coating designation G90 in accordance with ASTM A653/A653M or by other metallic or non-metallic coatings that provide equivalent protection.</p>
Annex 101.DVD		<p><b>Resistance to Heat and Fire</b></p>
101.DVD.5.3		<p>With reference to Clause 101. DVD.5.1, components such as wire, tubing, sleeving, or tape that are located within 3 mm (0,12 in) of an ELECTRICAL CONNECTION as shown in Figure 101.DVD.5.1 shall have a flammability classification as follows:</p> <p>a) <del>VW-1 for wire evaluated in accordance with CSA C22.2 No. 0.3 and UL 1581;</del> <u>VW-1 for wire evaluated in accordance with CSA C22.2 No. 2556 or UL 2556;</u> b) VW-1 for tubing and sleeving evaluated in accordance with CAN/CSA C22.2 No. 198.1 and UL 224 or UL 1441; or c) evaluated in accordance with CSA C22.2 No. 197 and UL 510 for flame-retardant insulating tape.</p>
101.DVD.6.8		<p>The hot coil shall be:</p> <p>a) Nichrome wire (80% Nickel, 20% Chromium, <u>20 AWG</u>, in accordance with ASTM B344); or <u>b) FeCrAl alloy wire (72.2% Iron, 22% Chromium, 5.8% Aluminum; 20 AWG, in accordance with ASTM B603)</u></p> <p>and shall be applied to a connector or switching contact such that the adjacent non-metallic combustible materials will be ignited during the test.</p>
101.DVD.6.9		<p>In the application of the hot coil to the part under test, the hot coil may be inserted into the part, or the wire may be externally wrapped around the part under test.</p>



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		<p>The intent is to achieve complete combustion of the part under test and/or adjacent materials.</p> <p>a) When inserting the coil into the part under test, a single strand of wire with a minimum length of 100 mm (4,0 in) shall be formed into a coil with a diameter and length that approximates the connection under evaluation. The coil shall be inserted in place of the connection under evaluation. In the case of a multi-pin connector, a single terminal pin shall be removed from the connector such that the coil can be inserted in the worst case location (typically the lowest position). If the worst case position is not obvious, then multiple positions shall be evaluated.</p> <p><u>A 3,5 mm (0,138 in) diameter (max) solid ceramic-rod support may be used to support the hot wire coil during the test. The ceramic-rod may be either smooth (non-threaded) or threaded (8 wraps/inch) to accommodate the wire.</u></p> <p>b) When externally wrapping a connector or uninsulated terminal, use minimum 50 mm (2,0 in) of the wire specified in Clause 101. DVD.6.8 to achieve a minimum of three evenly spaced wraps along the length of the connector or uninsulated terminal.</p> <p>c) Uninsulated terminals shall be wrapped with a non-flammable tape or sleeve prior to wrapping with hot coil wire to prevent shorting out portions of the hot coil wire.</p> <p>d) In the case of switching devices, a coil of wire shall be placed inside the device in the position of the contacts and appropriately supported to prevent movement during the test. See Clause 101.DVD.5.1.</p> <p>Insulated wire leads shall be used to supply power to the hot coil and shall be supported and strain-relieved to prevent the hot coil from shifting during testing.</p>
101.DVD.6.10		<p>The hot coil shall be energized such that current in the circuit is immediately increased to <u>13,9 A if using the nichrome wire specified in Clause 101.DVD.6.8 a), or 12,5 A if using the FeCrAl alloy specified in Clause 101.DVD.6.8 b),</u> and held constant for the duration of the test. If no ignition is detected within 20 min, the current shall be removed from the hot coil. If ignition is detected, current shall be held constant until burning of the non-metallic combustible material ceases naturally or there is ignition of the cheesecloth. If ignition of the cheesecloth occurs, the fire shall be extinguished as soon as possible. If the hot coil fractures prematurely, the test shall be repeated.</p>