

STANDARD INFORMATION

Standard: UL 1638 / ULC 526

Standard ID:

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
[UL 1638:2023 Ed.6]

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
[ULC 526:2023 Ed.5]

Previous Standard ID:

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
[UL 1638:2016 Ed.5+R:06Sep2017]

Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
[ULC S526:2016 Ed.4]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **September 24, 2027**

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 Reports not updated to this version by the effective date above will be withdrawn.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:

- Changes in the Measurement of Effective Luminous Intensity (Light Output) Test to include LEDs
- Changes to the method for determining the Quadrant vector alignment
- New construction and performance requirements for battery-powered units, including primary batteries, secondary batteries used for stand-by power, and rechargeable lithium-ion batteries
- Addition of requirements for the evaluation of reduced spacings on printed-wiring boards to be consistent with requirements for initiating devices
- New Requirements for Wireless Systems
- Addition of new firmware requirements
- Revisions to gasket requirements for outdoor use products
- Revisions to the ultraviolet light and water exposure test for outdoor products
- Revisions to the Accelerated Air-Oven Aging Test for outdoor use products

Specific details of new/revised 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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		<p>Additions to existing requirements are <u>underlined</u> and deletions are shown lined-out below.</p>
9	Info	<p>Enclosures</p> <p><i>New section added;</i></p> <p>Gaskets</p> <p>9.7 A gasket used to seal an opening between two parts that are intended to be separated in the field for installation or maintenance shall comply with:</p> <p>See standard for details.</p> <p><i>New section added;</i></p> <p>Covers</p> <p>9.8 An enclosure cover shall be secured against opening or removal by means requiring the use of a common or special tool. A decorative cover or trim that, if removed, does not expose live electrical or mechanical parts is exempt from this requirement.</p> <p>See standard for details.</p>
14	Info	<p>Electrical Components</p> <p><i>New section added;</i></p> <p>Batteries</p> <p>14.12 A battery or batteries used as primary or backup power shall comply with the applicable requirements in:</p> <p>See standard for details.</p> <p><i>New section added;</i></p> <p>Firmware Update (If Provided)</p> <p>16 A firmware release level shall identify the firmware of a product. A new release level shall be assigned due to any changes in the firmware.</p> <p>See standard for details.</p>



CLAUSE	VERDICT	COMMENT
20	Info	Measurement of Effective Luminous Intensity (Light Output)
20.1	Info	General
20.1.1		Each visible signal device intended for public mode use shall produce a minimum effective luminous intensity of 15 cd. The flash rate shall lie between 1 and 2 flashes per second. The flash duration shall be 200 ms or less as measured between the 10 % amplitude values of the leading and trailing edges of the light pulse. <u>Rated light output is to be based on a maximum 20 ms light pulse. For pulse durations between 20 ms and 200 ms, an effective candela equivalency to a 20 ms light output is determined by dividing the measured light output value by the corresponding multiplier in Table 20.1. Light output ratings for pulse widths less than 20 ms are the measured value obtained in 20.2, Light Output Measurements for Public Mode Signaling.</u> The minimum effective luminous intensity shall correspond to the marked rating value as measured in 20.2.
20.4	Info	Quadrant vector alignment for public mode signaling
		<i>New clause added;</i>
20.4.1		To obtain the light output of the compound angles required for an emergency warning and public mode visual signal, the sample is to be mounted as shown in Figure 20.6 and Figure 20.7. When rotated between the angles of 35 and 45 degrees about the vertical axis of the center focal point (Figure 20.6) and rotated between the angles of 45 and 60 degrees about the horizontal axis of the center focal point (Figure 20.7), the light output of any one combination within these angles shall not be less than 24 % of the rated light output. This procedure is to be done for each of the lower left and right quadrants of a wall mounted sample and all four quadrants for a ceiling mounted sample.
20.6	Info	Synchronization of light output test
20.6.3		The maximum number of visible signal devices, as indicated in the installation instructions, are to be interconnected together and each of the devices are to be placed in a position of normal use and positioned so that the light output of each visible signal device is directed at a photo transistor switch circuit. <u>The leading edge of the first detected visible signal to flash to the trailing edge of the last visible signal to flash, shall be within 10 ms of the pulse width of a single visible signal.</u> <u>The visible signal devices under test are to be operated in an area where the ambient light condition is less than 10 % of the effective illumination produced by any one visible signal device.</u> During signal operation, the room is to be monitored for any abnormal light conditions.



CLAUSE	VERDICT	COMMENT
23	Info	Dielectric Voltage-Withstand <i>New clause added;</i>
23.5		A printed-wiring assembly or other electronic circuit component that is capable of short-circuiting (or being damaged by) the test potential, is to be removed, disconnected, or otherwise rendered inoperative before the test. A representative subassembly is then to be tested instead of an entire unit. Rectifier diodes in the power supply may be individually shunted before the test to avoid destroying them in the case of a malfunction elsewhere in the secondary circuits. <i>New section added;</i>
24		Evaluation of Reduced Spacings on Printed-Wiring Boards In accordance with the Exception of 15.1, printed-wiring board traces of different potential having reduced spacings shall comply with: See standard for details.
26	Info	Variable Ambient Temperature
26.1	Info	General As a result of the exposure to 26.2, Effect of Shipping and Storage Temperature, 26.3, High and Low Ambient Temperature, and Section 27, Humidity:
26.1.1		a) Visible signaling devices shall not present a risk of shock; b) Light output shall not be less than rated; and c) <u>A wireless notification appliance shall send and receive alarm and trouble signals while in 26.3, High and Low Ambient Temperature, and Section 27, Humidity. The trouble signal must individually identify the affected device as required in Section 6, Control Unit Interface.</u>
33	Info	Corrosion Tests
33.1	Info	General Following exposure to the environment, the sample shall be allowed to stabilize to room conditions and then shall comply with the following:
33.1.3		a) Section 23, Dielectric Voltage-Withstand; b) The applicable tests in Section 20, Measurement of effective luminous intensity (light output); and c) <u>A wireless notification appliance shall not be reduced in performance when tested in accordance with 50.3 following each exposure.</u>



CLAUSE	VERDICT	COMMENT
37	Info	Tests on Polymeric (Plastic) Materials
37.2	Info	Air-oven aging test (temperature)
37.2.2		At least three representative samples shall be mounted on supports in an air circulating oven maintained at 90 ± 2 °C (194 °F) for 7 d or at 70 ± 2 °C (158 °F) for 28 d. Following the aging period, the sample shall be removed from the oven and permitted to cool to room temperature before being examined as described in 37.2 for any distortion which exposes high-voltage uninsulated current carrying parts. Falling off of the sample's cover shall be permitted only when parts operating at a potential greater than 30 Vac or 42.4 Vdc are not exposed, operation is not affected, and the cover can be replaced as intended. <u>Gaskets on samples intended for outdoor use shall be visually examined for evidence of deterioration such as cracking, shrinkage, distortion, or similar deterioration to an extent that it affects the integrity of the seal. If visual evidence exists, a sample shall be subjected to Section 34, Water Spray Test, followed by light output measurements as described in Section 20, Measurement of Effective Luminous Intensity (Light Output).</u> Where the conditioning process has damaged electronic components, it is permissible to replace them.
38	Info	Mechanical Strength Tests for Enclosures
		<i>New clause added;</i>
38.5		As a result of the tests specified in 38.2 – 38.4, there shall be no exposure of live parts, impairment of the operation of the speaker, or creation of a risk of electric shock.
		<i>New clause added;</i>
38.6		A bending force created by a 3.0 m (118-7/64 in) minimum length of conduit of the intended size shall be installed: a) In a hub or an opening if provided as part of the enclosure; or b) If a hub or opening is not provided, in the center of the largest unreinforced surface intended for the connection of conduit.



CLAUSE	VERDICT	COMMENT
38.7		<p>The enclosure shall be securely mounted as intended in service, but positioned so that the installed conduit extends in a horizontal plane. The test shall be terminated once the deflection of the conduit end exceeds 255 mm (10 in). If a weight is necessary to cause the conduit end to deflect, the test shall be terminated once the deflection of the conduit end exceeds 255 mm (10 in) or once a bending moment of 33.9 N-m (300 lb-in) is achieved. The magnitude of the weight shall be determined from the equation:</p> $W = (0.1 M 0.5CL) / L$ <p>In which:</p> <p>W is the weight to be hung at the end of the conduit, in kg or lb L is the length of the conduit from the wall of the enclosure to the point at which the weight is suspended, in m or in C is the weight of the conduit, in kg or lb M is the bending moment required, in Nm or lb-in</p> <hr/> <p><i>New section added;</i></p> <p>Battery-Powered Units</p>
42		<p>notification appliance that uses a battery as the main source of supply shall be capable of producing an alarm signal for at least 5 min at the battery voltage at which a trouble signal is obtained, followed by a minimum of 7 days of trouble signal indication.</p> <p>See standard for details.</p> <hr/> <p>Info MARKINGS</p> <hr/> <p><i>Section 46 has been completely re-written</i></p>
46		<p>General</p> <p>See standard for details.</p> <hr/> <p><i>New section added;</i></p>
47		<p>Markings affixed to a visible signaling device shall be sufficiently durable as to resist the deleterious effects of handling, cleaning agents, and the like, expected in the intended use.</p> <p>See standard for details.</p> <hr/>



CLAUSE	VERDICT	COMMENT
	Info	INSTRUCTIONS
		<i>New section added;</i>
		Manufacturer's Published Instructions
48		Visible signaling devices packaged individually shall include manufacturer's published instructions and drawings as specified in 48.2 – 48.7 with each unit. Where devices are packaged in bulk (multiple devices in one single package) and not intended for individual resale, a minimum of one set of installation instructions and drawings shall be provided. See standard for details.
	Info	SPECIALIZED REQUIREMENTS/APPLICATIONS
49	Info	Requirements for Protective Covers and Accessories for Visible Signaling Devices
49.2	Info	Manufacturer's Published Instructions
		Manufacturer's published instructions shall be provided with each protective cover and accessory and shall include the following information as a minimum:
49.2.1		a) Detailed mounting instructions, including such information as is required to ensure all required spacing is maintained, and normal operation of the device is maintained; b) The specific compatible visible signaling device(s) with which the protective cover/accessory has been investigated per 49.1.2; c) The effect of the accessory on normal operation as described in 49.1.2; and d) Installation wiring drawings for the accessory where applicable. These shall be in accordance with 48.5; and <u>e) Replacement of consumables, including method and material to be used.</u>
		<i>New section added;</i>
		Special Requirements for Wireless Systems
50		If wireless transmission is used between notification appliances and a fire alarm control unit or a notification appliance extender, it shall be installed in compliance with the requirements outlined in: See standard for details.