

## STANDARD INFORMATION

**Standard:** UL 268 / ULC S529

**Standard ID:**

Smoke Detectors for Fire Alarm Systems [UL 268:2016 Ed.7+R:31Oct2019]

Standard for Smoke Detectors for Fire Alarm Systems [CAN/ULC S529:2016 Ed.4+R2]

**Previous Standard ID:**

Smoke Detectors for Fire Alarm Systems [UL 268:2016 Ed.7+R:15Jul2016]

Standard for Smoke Detectors for Fire Alarm Systems [CAN/ULC S529:2016 Ed.4+R1]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **June 1, 2025**

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 Reports not updated to this version by the effective date above will be withdrawn.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

- Special Applications
- Fire Test Revision
- Sensitivity Shift Criteria
- Go/No-Go Flaming Polyurethane Foam Test
- Nuisance Sensor Requirements
- IRLED Light Degradation Determination
- Alarm Silence Requirements
- Additional Stability Tests for Multi-Criteria Smoke Detectors Employing CO Gas Sensors
- Audibility Test for Battery Operated Smoke Detectors
- Mechanical Push Test for Push-Type Features
- Firmware Update Requirements

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</i>
		<b><i>New section added;</i></b>
6A		<b>Silencing Feature (optional)</b> A smoke detector with integral alarm sounding appliance shall be permitted to be provided with an automatically resettable alarm silencing feature. See standard for details.
29	Info	<b>Normal operation test</b>
29.3	Info	<b>Sensitivity shift criteria</b>
29.3.1		During or immediately after performance tests, the sensitivity of the smoke sensor shall not vary more than $\pm 3.3$ percent per meter ( $\pm 1$ percent per foot) [ $\pm 0.014$ optical density per meter [ $\pm 0.0045$ optical density per foot]] obscuration from the value recorded prior to the test. For non-multi-criteria smoke detectors, the sensitivity limits shall comply with 31.1.1. For multi-criteria detectors manufacturers shall define acceptable sensitivity shift for non-smoke sensors <u>that will allow the smoke detector to pass the Fire Tests (Section 41 and Annex I) and Smoldering Smoke Test (Section 42).</u>
31	Info	<b>Sensitivity test</b>
31.1	Info	<b>Sensitivity test – smoke sensor</b>
31.1.1	Info	<b>General</b>
31.1.1.2		<del>When a detector evaluated for a special application employs sensitivities outside of the range specified in Table 9 and/or Table 10, it shall be evaluated using the sensitivities specified in the conditions covered by the smoke detector's Technical Bulletin (see Technical Bulletin, Section 84).</del> <u>When a detector evaluated for a special application employs sensitivities more sensitive than the limit specified in Table 9 and/or Table 10, it shall be evaluated per the requirements in 31.1.8, Special Application Mode (optional).</u>
		<b><i>New section added;</i></b>
31.1.8		<b>Special Application Mode (optional)</b> Detectors that have a special application mode/configuration in accordance with 31.1.8.2 to 31.1.8.4 shall comply with normal application requirements wherein the detector or relevant sampling ports of an air sampling detector complies with all applicable requirements defined in this standard. See standard for details.



CLAUSE	VERDICT	COMMENT
32A	Info	<b>Alarm Silenced Test (optional)</b> <i>New clause added;</i>  To determine the duration of the alarm silenced period, one detector, in the normal standby condition, is to be placed in the sensitivity test chamber. See the Sensitivity Test, Section 38. The smoke is to be increased until the smoke detector goes into an alarm condition. The smoke is to be maintained at an abnormal amount for the duration of the test. After the smoke detector has been in an alarm condition for 1 min, the silencing means is to be actuated and the time recorded between operation of the silencing means and reactivation of the alarm signal. The maximum time of silencing shall not exceed the time limits specified in 6A.2. This test shall be conducted on four individual samples.
37	Info	<b>Reduction in Light Output Test</b>  The smoke sensitivity of a detector employing an LED as the functional light source shall not be reduced to less than the minimum levels when the light output from the LED is reduced to 50 percent of the intended output or to the light level anticipated at the end of the devices' specified lifetime. The light level anticipated at the end of the <u>devices' specified lifetime shall be determined through manufacturer's testing of the LED. During this determination, the duty cycle and test temperature of the LED under test shall be selected such that the burn-in test length multiplied by the as-tested duty cycle, divided by the end-use duty cycle, and related to the maximum device operating temperature by using the Arrhenius equation (as described in D4.2.1), is equal to or greater than the devices' specified lifetime. For the purposes of this testing, IRLEDs employed in smoke detectors without a specified lifetime shall be tested for the equivalent of a 20-year lifetime.</u>
37.1		<i>New section added;</i>
39A		<b>Stability Tests for Multi-Criteria Smoke Alarms Incorporating CO Gas Sensor(s)</b>  Two representative multi-criteria smoke detector samples set at the manufacturer's defined CO gas sensitivity setting shall be subjected to the following CO gas concentrations and exposure times (absent of smoke or simulated smoke) and shall not produce an alarm signal:
39A.1		a) Exposure to 30 ±3 ppm of CO for a minimum of 30 days; b) Exposure to 70 ±5 ppm of CO for a minimum of 60 minutes; and c) Exposure to an increase in CO of 16 ppm per minute (starting from fresh air) for a minimum of 19 minutes.
39A.2		Tests defined in 39A.1 shall be conducted using equipment and methods identified in the Sensitivity Test (Section 39) specified in the Standard for Single and Multiple Station Carbon Monoxide Alarms, UL 2034.



CLAUSE	VERDICT	COMMENT												
40	Info	<b>Test for effect of air velocity</b>												
		<i>New clause added;</i>												
40.3		For detector velocities in excess of 300 fpm, the detector shall be tested to Fire Tests (Section 36) in the Standard for Smoke Detectors for Duct Application, UL 268A.												
41	Info	<b>Fire tests</b>												
41.1	Info	<b>General</b>												
		<i>New clause added;</i>												
41.1.6		For smoke detectors incorporating nuisance sensors, the manufacturer shall provide a method or means to simulate the nuisance condition. Tests shall be performed as defined in Sensitivity Test, Section 31, Fire Tests, Section 41, Smoldering Smoke Test, Section 42, Smoldering Smoke Test – Maximum Obscuration Without Alarm, Section 43, and Annex I with the simulated nuisance condition activated.												
		<i>New clause added;</i>												
41.1.7		Smoke detectors incorporating nuisance sensors shall also be subjected to the tests under normal operating conditions without the nuisance condition present or simulated as specified in 41.1.5.												
41.2	Info	<b>Paper fire</b>												
		The materials and procedures shall be used as follows:												
		a) Combustible – Shredded newspaper <u>preconditioned in a relative humidity of 50 ±5% at a temperature of 23 ±2 °C (73 ±3.6°F) for at least 48 h prior to the test is to be cut in strips as follows:</u>												
		<table border="1"> <thead> <tr> <th></th> <th>In the United States</th> <th>In Canada</th> </tr> </thead> <tbody> <tr> <td>Width</td> <td>6 – 10 mm (0.25 – 0.375 inch)</td> <td>6 – 10 mm (0.25 – 0.375 inch)</td> </tr> <tr> <td>Length</td> <td>25.4 – 102 mm (1 – 4 inches)</td> <td>25.4 – 102 mm (1 – 4 inches)</td> </tr> <tr> <td>Total weight</td> <td>42.6 g (1.5 oz)</td> <td>28.3 g (1 oz)</td> </tr> </tbody> </table>		In the United States	In Canada	Width	6 – 10 mm (0.25 – 0.375 inch)	6 – 10 mm (0.25 – 0.375 inch)	Length	25.4 – 102 mm (1 – 4 inches)	25.4 – 102 mm (1 – 4 inches)	Total weight	42.6 g (1.5 oz)	28.3 g (1 oz)
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Total weight	42.6 g (1.5 oz)	28.3 g (1 oz)												
41.2.2		<u>The paper, cut and weighted to the dimensions above, is to be placed into the receptacle, see(b), with the bottom covered temporarily by a flat plate. The receptacle is to be tamped periodically during the pouring operation until the paper contents are even with the top of the receptacle. The paper is then to be further tamped by hand or by a rod 25.4 mm (1 in) in diameter until the paper level is of a height specified by country, see #1 or #2, but below the top edge of the receptacle. A hole approximately 25.4 mm (1 in) in diameter is to be formed through the center from top to bottom of the paper. The temporary bottom plate is then to be removed and the assembly mounted 0.9 m (3 feet) above the floor on a 127-mm (5-in) diameter support.</u>												



CLAUSE	VERDICT	COMMENT
		1) <u>In the United States – a height of 102 mm (4 inches)</u> 2) <u>In Canada – a height of 115 mm (4.5 inches)</u>
42	Info	<b>Smoldering smoke test</b> <i>New clause added;</i>
42.11		For multi-criteria smoke detectors incorporating nuisance sensors, the smoldering smoke test shall be performed with the detectors in the presence of the nuisance. As an alternative, the manufacturer may simulate the nuisance condition in such a way that the detector considers itself to be in the presence of the nuisance. <i>New section added;</i>
67A		<b>Mechanical Push Test for Push-Type Features</b>  This test shall be conducted on smoke detectors with a functional feature (i.e., test button, strobe test button, etc.) greater than 12.7 mm (1/2 in) in diameter. See standard for details.
70	Info	<b>Audibility test</b>
70.2	Info	<b>Sound output measurement (United States only)</b> <i>New clause added;</i>
70.2.3.1		A battery powered detector is to be energized from batteries under each of the following conditions along the trouble signal level determination curve illustrated in Figure 28 or equivalent, non-discharged battery (a battery with some unknown shelf life, such as those purchased at a retail outlet) with enough added resistance to obtain a trouble signal (Point D of Figure28), or the maximum resistance for the particular battery based on documented data, whichever is less:  a) Battery depleted to the trouble signal level voltage, no added resistance; b) Battery depleted to a voltage value between conditions A and B above, which is evaluated to be the least favorable for sound output. For a straight line curve, it is the midpoint voltage. For a nonlinear curve the voltage value is to be specified by the manufacturer. <i>New clause added;</i>
70.2.3.2		The equivalent of a battery shall be identified as a voltage source with a series resistance adjusted to a level at which a trouble signal is obtained during the normal standby condition. The resistance and voltages used are to be those that were determined during the Circuit Measurement Test, Section 45. <i>New section added;</i>
72A		<b>Firmware Update (if provided)</b>  This section contains requirements for firmware updates. See standard for details.



CLAUSE	VERDICT	COMMENT
		<b><i>New section added;</i></b>
73A		<b>Evaluation of Reduced Spacings on Printed-Wiring Boards</b>  This section contains requirements for spacings on printed-wiring boards. See standard for details.
	Info	<b>Marking</b>
81	Info	<b>General</b>  A detector shall be permanently marked with the following information in a contrasting color, finish, or equivalent. Unless the letter height is specified all markings shall be at least 1.2 mm (3/64 inch) high.  g) Smoke sensitivity setting for a detector having a fixed factory setting. For detectors intended to be adjusted in the field, the range of sensitivity shall be indicated as specified below. This information may appear on the installation wiring diagram.
81.1		1) The marked nominal smoke sensitivity including range shall be indicated in the form of percent per meter (percent per foot) obscuration and shall correspond to the units of smoke measurement indicated on the sensitivity test meter. When the sensitivity test feature requirement uses units other than percent per meter (percent per foot) obscuration, the sensitivity range using these units shall also be included in the marking. <u>For a detector that is capable of receiving a firmware update and the sensitivity production range is impacted by the content of the firmware update (such as a new smoke algorithm), a means of indicating the current certified sensitivity or sensitivity range for the current firmware version of the unit shall be provided.</u>
83	Info	<b>Installation Instructions – Wiring Diagram</b>  <b><i>New section added;</i></b>
83.5		<b>Special Applications</b>  Installation instructions for special application detectors shall include information relating to operating the detector in special application mode/configuration. See standard for details.
Annex I	Info	<b>FLAMING AND SMOLDERING POLYURETHANE FOAM TESTS AND COOKING NUISANCE TEST REQUIREMENTS (UNITED STATES ONLY)</b>  <b><i>New section added;</i></b>
I.5		<b>Go/No Go Flaming Polyurethane Foam Test</b>  This section contains requirements for the go/no go test. See standard for details.