

STANDARD INFORMATION

Standard Number: CSA C22.2 No. 187
Standard Name: Electrostatic Air Cleaners
Standard Edition and Issue Date: 5th Edition dated January 1, 2020
Date of Revision: January 1, 2020
Date of Previous Revision of Standard: 4th Edition revised April 1, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **January 1, 2022**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revise 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requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

Overview of Changes:

- Addition of safety function requirements and power supply requirements
- Revision of ozone requirements
- Addition of requirements for coatings and spacings on printed circuit boards

Specific details of new/revise 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).

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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 lined out below.</i>
5	Info	Construction
5.15	Info	Spacings
5.15.1	Info	Low-voltage circuits <i>New clause added;</i>
5.15.9.1		The spacings between circuit paths on printed circuit boards shall be not less than 1.6 mm for 31 to 300 V rms and 0.8 mm for extra-low-voltage safety circuits if a short-circuit between the paths may result in unsafe operation of the control. <i>New clause added;</i>
5.15.9.2		The spacings specified in Clause 5.15.2.1 may be reduced by 50% provided the following conditions are met: a) the board is coated with a suitable material and meets the requirements of Clause 6.15; and b) prior to wave soldering, the board (except at solder pads) is coated with a suitable solder-resistant material. <i>New clause added;</i>
		Safety functions
5.22		An electronic or solid-state circuit performing any safety functions shall be evaluated to the requirements of CSA C22.2 No. 0.8. Ozone detector providing ozone level limiting action shall be evaluated to minimum Class B control function of CSA C22.2 No. 0.8. <i>New clause added;</i>
5.23		Thermal links Thermal links shall meet the requirements of CSA C22.2 No. 60691 for the required maximum calibration temperature.



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		<i>New clause added;</i>
		Temperature controls
		The temperature, safety, limiting, and regulating controls shall meet the requirements of
5.24		a) CSA C22.2 No. 24, as follows: i) endurance cycles as applicable for the end application use in accordance with Table 10; ii) the calibration tolerance requirements as applicable for the end application use in accordance with Table 6; and iii) for electronic controls with safety functions, control Class B minimum applies and for electronic controls with no safety functions, control Class A applies; or b) CAN/CSA E60730-1 and CAN/CSA E60730-2-9, as follows: i) Type 2 and for electronic controls, control Class B minimum applies; ii) endurance cycles as applicable for the end application use, as referenced in Annex CC of CAN/CSA E60730-2-9; iii) the calibration and drift tolerance requirements as applicable for the end application use; iv) as referenced in Annex AA of CAN/CSA-E60730-2-9; and v) controls without any declared safety functions and calibration tolerances are Type 1, and for electronic controls where no safety functions are conducted, control Class A applies.
5.25		<i>New section added;</i>
		Power supply
		The power supply shall meet the requirements of
5.25.1		a) CSA C22.2 No. 107.1, for use in other than a controlled environment. b) CSA C22.2 No. 223, for extra-low-voltage for household, telecommunication, and motor-operated equipment applications, provided that there is no accessible metal component. If there are accessible metal parts, the power supply shall be a double insulated type.
5.25.2		Notwithstanding the requirements specified in Clause 5.25.1a), an integrated switching power supply (in addition to the requirements of this Standard) shall comply as a minimum with the applicable abnormal operation as specified in Clause 6.6and the general construction requirements of CSA C22.2 No. 107.1.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
		Optical isolators and similar devices
5.26		Optical isolators and similar devices used to provide electrical isolation shall meet the requirements for such components in CSA Component Acceptance Service No. 5A. The circuit in which the component is located shall be subjected to the abnormal test specified in Clause 6.3.3, and the dielectric withstand test specified in Clause 6.5 to ensure the required isolation is maintained.
6	Info	Tests
6.3	Info	Temperature — Abnormal
		Additional requirements
		In addition to the above, the following shall be conducted where applicable: a) components such as solid-state devices shall be short-circuited and open-circuited, one component at a time, including bridge rectifier diodes; Note: Resistors of thin film, thick film, or wire-wound (single layer) need only be open-circuited. b) capacitors X1 and Y type, approved to CSA E60384-14, need only be open-circuited; c) rotors of motors shall be stalled; or d) transformer secondary shall be short-circuited and loaded to simulate the worst-case scenario.
6.3.4		
		<i>New section added;</i>
6.15		Evaluation of coatings on printed circuit wiring boards
		General
6.15.1		Three previously untested samples shall be subjected to the following tests.
6.15.2		Dielectric strength on printed wiring boards
6.15.2.1		One sample shall be flexed three times to simulate conditions that could be expected under normal use and manufacturing conditions. After flexing, the sample shall be subjected to the following ac test voltages applied for 1 min, without breakdown, between
6.15.2.2		a) adjacent extra-low-voltage safety circuits: 500 V; b) adjacent low-voltage and extra-low-voltage circuits: twice rated voltage + 1000 V; and c) adjacent low-voltage circuits: twice rated voltage + 1000 V.
6.15.3		Dielectric strength after temperature conditioning
6.15.3.1		One sample shall be conditioned for 96 h at 90 °C.



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6.15.3.2		The tests of Clause 6.15.2 shall be repeated.
6.15.4		Dielectric strength after humidity conditioning
6.15.4.1		The remaining sample shall be conditioned for 96 h at 32 ± 2 °C and $85 \pm 5\%$ RH. The test shall be conducted in such a manner that no condensate appears on the test sample.
6.15.4.2		The tests of Clause 6.15.2 shall be repeated.
6.15.5		Following each of the above tests, the sample shall be investigated for adhesion of the coating to the board by scraping or cutting. The coating shall not flake.
7	Info	Ozone
7.5	Info	Electrostatic in duct-type air cleaners for residential use
7.5.2	Info	Duct test fixture
		The duct test fixture shall be constructed in accordance with ASHRAE 52.2, Figure 4.1.
		The test fixture shall consist of the following main features:
7.5.2.1		i) The downstream ozone measurement sampling tube shall include a 90° bend and be positioned <u>at a minimum of 2.135 m from the downstream mixing orifice as specified under ASHRAE 52.2 adjacent to the downstream particle sampling probe such that</u> . The opening of the probe shall face into the airstream at the centerline of the duct.
7.5.5	Info	Test method
7.5.5.2	Info	Flow
		Test conditions
		The test in Clause 7.5.5.1 shall be performed with the blower <u>fan set to the following two flows:</u>
7.5.5.2.1		a) flow test: 0.177 m ³ /s; and b) <u>high flow test: maximum declared by the manufacturer.</u>
		<u>The flow shall be monitored at 1 min intervals during the test.</u>



CLAUSE	VERDICT	COMMENT
		<p>New clause added;</p> <p>Ozone emission rate calculation</p> <p>The corrected ozone concentration shall be calculated as per Clause 7.5.5.4. The corrected ozone concentration shall be converted to mg/m³ using the formula</p> $O^3 \left(\frac{mg}{m^3} \right) = \frac{(O^3 ppb / 1000) \times 48 \frac{g}{mol}}{24.45}$ <p>The ozone emission rate shall be calculated using the following formula:</p> <p>7.5.5.2.2</p> <p>E = CQ</p> <p>where E = emission rate mg/h C = concentration in mg/m³ Q = flow in m³/h</p> <p>The ozone emission rate shall be recorded as mg/h for each of the three flows noted in Clause 7.5.5.2.1.</p> <p>The flow that has the highest emission rate shall be used for the ozone emission test in Clause 7.5.5.3.</p> <hr/> <p>Calculations</p> <p>The corrected ozone concentration shall be calculated for each measurement taken during the test as follows:</p> <p>7.5.5.4</p> <p>[downstream ozone concentration measurement at Time (n) – upstream ozone concentration measurement at Time (n)] = corrected ozone concentration at Time (n)</p> <p>The corrected maximum ozone concentration shall not exceed 0.050 ppmv.</p> <p><u>The highest concentration of ozone from the two tests (low and high flow) shall be used for the determination of pass or fail.</u></p> <hr/> <p>Reporting requirements</p> <p>Reporting requirements shall be as follows:</p> <p>7.5.5.6</p> <p>a) calculate and report the 8-h TWA using the corrected ozone concentration as noted in Annex A; and b) report the corrected maximum ozone concentration during the test: i) the results shall include the results from both tests (low and high flow); and ii) the results shall include the flow used for the high flow test.</p>



CLAUSE	VERDICT	COMMENT
7.6	Info	UVC in duct-type air purifiers for residential use
7.6.4	Info	Background ozone measurement
		Flow
7.6.4.2		<p>The test in Clause 7.6.4.1 shall be performed with the blower fan at <u>the two following flows</u>:</p> <p>a) 0.177 m³/s; and b) maximum declared flow by the manufacturer. If there is no maximum, the flow shall be set to 0.943 m³/s.</p>
		Calculations
7.6.4.4		<p>The corrected ozone concentration shall be calculated for each measurement taken during the test as follows:</p> <p>[downstream ozone concentration measurement at Time (n) – upstream ozone concentration measurement at Time (n)] = corrected ozone concentration at Time (n)</p> <p>The corrected maximum ozone concentration shall not exceed 0.050 ppmv.</p> <p><u>The highest concentration of ozone from the two tests (low and high flow) shall be used for the determination of pass or fail.</u></p>
		Reporting requirements
7.6.5		<p>The reporting requirements shall be as follows:</p> <p>a) calculate and report the 8-h TWA using the corrected ozone concentration as noted in Annex A; and b) report the corrected maximum ozone concentration during the test: i) <u>the results shall include the results from both tests (low and high flow)</u> ii) <u>the results shall include the flow used for the high flow test.</u></p>