

TEST REPORT	
UL 507	
Standard For Safety of Electric Fans	
UL 8750	
Light Emitting Diode (LED) Equipment for Use in Lighting Products	
Job Number.....	XK2401012059S
Test by (print+signature)	Rachel Yang
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Approved by (print+signature).....	Andy Wang
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Total number of pages	111 pages
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preparing the Report.....	202, Building 3, No.111, Huanguan Middle Road, Songyuanxia Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China
Applicant's name.....	Zhongshan Qianze Technology Co., Ltd
Address	2nd Floor, 2nd Room, No. 373 Caoer DongAn North Road, Guzhen Town, Zhongshan City
Manufacturer's name	Zhongshan Qianze Technology Co., Ltd
Address	2nd Floor, 2nd Room, No. 373 Caoer DongAn North Road, Guzhen Town, Zhongshan City
Test specification:	
Standard	UL 507 Issued: Edition 10, November 09, 2017, Rev: May 27, 2020 UL 8750 Issued: September 15, 2015 Ed.2; Rev: July 06, 2021
Test procedure.....	UL test report
Non-standard test method.....	N/A
Test Report Form No.	UL507_8750_2020
Test Report Form(s) Originator.....	SiCT
Master TRF	Dated 2020-10
Test item description	Fan Light
Trade Mark.....	X-ARK
Model/Type reference.....	LD4480, 6575005, 6575001, 6575007, 9365413, LD5191, LD5192, LD5193, LD5194, LD5195, LD5196, LD5197, LD5198, LD5199, LD5200, LD5201, LD5202, LD5203, LD5204, LD5205, LD5206, LD5207, LD5208, LD5209, LD5210, LD5211, LD5212, LD5213, LD5214, LD5215
Ratings.....	AC100-130V, 50/60Hz, 48W



Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing..... :	
Date of receipt of test item..... :	January 8, 2024
Date (s) of performance of tests..... :	January 9, 2024 – January 12, 2024

General product information:

The product covered in this report is a Fan Light, it intended to indoor use, which is supplied from AC100- 130V.

Relevant Technical consideration:

-Mass of equipment: 0.97kg Max

-Maximum ambient temperature: 25°C.

- All the test were performed on model LD4480. And found to comply with the standard was subjected to all the tests. All models are identical except the model's name and appearance.

Copy of marking plate:

Fan Light	X-ARK
Model: LD4480	
Input: AC100- 130V, 50/60Hz, 48W	
	
Made in China	

Rating label

Notes:

- The above markings are the minimum requirements required by the safety standard as a reference marking label. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

- The model's name can be replaced by other's model in this report.

TEST LIST SUMMARY - UL 507

Clause	Performance	Required	Comply
41	<u>Leakage Current Test</u>	Y	P
42	<u>Continuity of Grounding Circuit Test</u>	N/A	N/A
43	<u>Limited Short-Circuit Test</u>	N/A	N/A
44	<u>Starting Current Test</u>	Y	P
45	<u>Input Test</u>	Y	P
46	<u>Temperature Test</u>	Y	P
47	<u>Dielectric Voltage Withstand Test</u>	Y	P
48	<u>Water Spray Test</u>	N/A	N/A
49	<u>Hosedown Test</u>	N/A	N/A
50	<u>Locked Rotor Test</u>	Y	P
53	<u>Humidity Conditioning Test</u>	Y	P
54	<u>Strain Relief Test</u>	Y	P
55	<u>Interconnecting Cords and Leads</u>	N/A	N/A
56	<u>Unguarded Impeller Tests</u>	N/A	N/A
57	<u>Push Back Relief Test</u>	N/A	N/A
58	<u>Oscillating Fan Test</u>	N/A	N/A
59	<u>Tests of Switches and Controls</u>	N/A	N/A
60	<u>Static Load Test For Mounting Means</u>	N/A	N/A
61	<u>Impact Test on Guards</u>	Y	P
62	<u>Static Force Test on Guards</u>	Y	P
63	<u>Impeller Test for Portable Fans</u>	Y	P
64	<u>Impeller Ignition Test</u>	Y	P
65	<u>Component Breakdown Test</u>	N/A	N/A
66	<u>Fuseholder Cover Test</u>	N/A	N/A
67	<u>Tests for General Purpose Transformers</u>	N/A	N/A
68	<u>Thermal Aging Test</u>	N/A	N/A
69	<u>Permanence of Marking Tests</u>	Y	P
70	<u>Drop Test</u>	N/A	N/A
71	<u>Security of Handle Test</u>	N/A	N/A
72	<u>Stability Test</u>	N/A	N/A
73	<u>Hassock Fan Load Test</u>	N/A	N/A
74	<u>Installation Test</u>	N/A	N/A
87.1	<u>Temperature test</u>	N/A	N/A
87.2	<u>Abnormal operation test</u>	N/A	N/A
91.1	<u>Static Load Test</u>	N/A	N/A
91.2.2	<u>Temperature condition test</u>	N/A	N/A
91.2.3	<u>Endurance test</u>	N/A	N/A
91.3	<u>Polymeric blades</u>	N/A	N/A

Clause	Performance	Required	Comply
91.4.1	Static load test for ceiling-suspended fan blade brackets	N/A	N/A
91.4.2	Dynamic load test for ceiling-suspended fan blade	N/A	N/A
99.1	Polymeric blades	N/A	N/A
114.2	Temperature test for rangehoods	N/A	N/A
114.3	Grease conditioning	N/A	N/A
114.4	Oven and humidify conditioning	N/A	N/A
114.5	Grease and humidity conditioning	N/A	N/A
114.9	Glass impact test	N/A	N/A
144.1	Normal temperature test	N/A	N/A
144.2	Abnormal test	N/A	N/A
160.1	Input test	N/A	N/A
160.2	Temperature test	N/A	N/A
160.3	Moisture resistance test	N/A	N/A
160.4	Stability test	N/A	N/A
160.5	Ultraviolet light and water exposure	N/A	N/A
160.6	Overflow test	N/A	N/A
160.7	Spill test	N/A	N/A
160.8	Static loading test	N/A	N/A
191.2	Input Test	N/A	N/A
191.3	Temperature Test	N/A	N/A
191.4	Dielectric Voltage Withstand Test	N/A	N/A
191.5	Abnormal Operation Locked Rotor Test	N/A	N/A
218.2	Charging input/output test	N/A	N/A
218.3	Input test	N/A	N/A
218.4	Temperature test	N/A	N/A
218.5	Charger temperature test	N/A	N/A
218.6	Dielectric voltage withstand test	N/A	N/A
218.7	Enclosure impact test	N/A	N/A
218.8	Drop test	N/A	N/A
218.9	Locked rotor test	N/A	N/A
218.10	Abnormal operation	N/A	N/A
218.11	Battery venting test	N/A	N/A
223.1	Ozone test	N/A	N/A
223.2	Ultraviolet radiation test	N/A	N/A

Remark: Y-Yes; N-No; N/A-Not Applicable; P-Pass; F-Fail

Appendix 1: Critical components information

Component Name	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Fan motor	XB	SD- 1688	DC24V 15W 1000T	UL 507	Tested with appliance
Enclosure	Formosa polypropylene (Ningbo) Co., Ltd.	PP	Min.thickness:1.5mm	UL 94	UL
Input lead wire	Interchangeable	Interchangeable	VW- 1, 105°C, 300Vac, min. 22AWG	UL 758	UL
LED Driver	JST	2.4G fan light controller	Input: AC100-130V 50/60Hz Output: DC70- 100V	UL 61347- 2- 13	Tested with appliance
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-6150	94V-0,130°C	UL 94, UL 746	UL E123995
Y capacitor	Haohua Electronic Co.,	CT7	AC250V;2200pF; T125	IEC60384- 14	UL
Fusing resistor (F1)	Shenzhen Great Electronics Co.,Ltd	RXF	10 ohm, 1W max	UL 62368- 1	UL
Transformer (T1)	LUCHUAN County DAHAI TECHNOLOGY CO., LTD	SMTT	250VAC 5A	UL 1598	Tested with appliance
- Bobbin	CHANGSHU SOUTH-EAST PLASTIC CO LTD	PF2A5- 151J	Phenolic, V-0, 150°C, min. 0.8 mm thickness	UL 94	UL (E136137)
-Magnet Wire	SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO LTD	2UEW	Min. 130。 C	UL 1446	UL (E239508)
- Tube	FLUOTECH INDUSTRIAL (HUIZHOU) CO LTD	TFT	200。 C, 300VAC, VW- 1	UL 224	UL (E175982)
- Tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312#	130°C	UL 510A	UL (E188295)

Clause 41 **Leakage Current Test****Method(s):**

One as received sample was placed on an insulated surface and was connected to a 120 V, 60 Hz source of supply. Leakage currents to earth ground were measured from all exposed conductive surface of the unit by a meter having an input impedance of 1500Ω resistive shunted by a capacitance of $0.15\mu\text{F}$. For a polymeric material or conductive surface other than metal, the leakage current was measured using a metal foil with an area of 100 x 200 mm in contact with the surface. If the surface was less than 100 x 200 mm, the metal foil was the same size as the surface. The foil did not remain in place long enough to affect the temperature of the products.

The measurement circuit for leakage current was as illustrated in Figure 41.1.

The test sequence was as follows:

- a) With switch S1 open, the appliance was connected to the measuring circuit. Leakage current was measured using both position of switch S2.
- b) Switch S1 was then closed, energizing the appliance, and within 5 second, the leakage current was measured using both position of switch S2.
- c) Leakage current was monitor until thermal stabilization under both position of switch S2 was used.

Result(s):

The leakage current of a cord-connected product rated 240 V or less was not more than: True X

a) 0.5 milliamperes for an ungrounded 2-wire product; False .

b) 0.5 milliamperes for a grounded, 3-wire, portable product; and

c) 0.75 milliamperes for a grounded, 3-wire, product:

- 1) Employing a standard attachment plug rated 20 amperes or less; and
- 2) Intended to be fastened in place or located in a dedicated space.

Note(s):

Condition	S1	S2	Measured max. leakage current (mA)	Limit current (mA)
a. - Unit ON	OFF OFF	P1 P2	0.05	0.5
b. - Unit ON (0 - 5 seconds)	ON ON	P1 P2	0.05	0.5
c. - Unit ON (Thermal stabilization)	ON ON	P1 P2	0.06	0.5

Conclusion:

This result (complied /-did not comply) with the requirements.

Clause 42**Continuity of Grounding Circuit Test****N/A****Method(s):**

The resistance was determined by any convenient method. When unacceptable results were obtained, either a direct or alternating current equal to the current rating of the maximum-current-rated branch-circuit overcurrent-protective device that was employed with the appliance was passed from the equipment grounding terminal or the point of attachment of the wiring system to the dead metal part, and the resulting drop in potential was measured between these two points. The resistance in ohms was determined by dividing the drop in potential in volts by the current in amperes passing between the two points.

Result(s):

The resistance was not more than 0.1 ohm between any point required to be grounded and True ____ False ____.

- ☐ For an appliance intended for permanent electrical connection, the point on the enclosure at which the power-supply system was connected.
- ☐ For a cord-connected appliance employing a grounding conductor in the cord, the point to which the grounding conductor of the power-supply cord was connected.

Note(s):

The resistance was ____ohm(s)

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 43**Limited Short-Circuit Test****N/A****Method(s):**

Three samples of the enclosure/conduit construction are to be subjected to the test. The test circuit is to have a power factor of 0.9 – 1.0 and is to be limited to the current specified in below Table.

Circuit capacity for short circuit test

Nominal Voltage	Equipment Full Load Amperes, Single Phase				Circuit Capacity, Amperes
	120	208	240	277	
	0-9.8 9.9-16	0-5.4 5.5-8.8	0-4.9 5.0-8.0	— 0-6.5	200 1000

The open-circuit voltage of the test circuit is to be 100 – 105 percent of the rated voltage of the equipment.

The enclosure is to be connected to the circuit through appropriately sized 6 inch-length of flexible metal conduit and a ground terminal suitable for connection of 3/0 AWG copper conductors is to be installed as close as possible to the internal conduit locknut. The free ends of each 4 foot-length of 3/0 AWG copper conductor are connected to each the supply as described in 43.2 through a series connected nonrenewable fuse that does not open in less than 12 seconds when carrying twice its rated current.

Test Voltage: _____ V; Test Current: _____ A.

Result(s):

The knockout construction still maintains its integrity, and no melting or otherwise opening of the knockout connection during the test.

True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 44**Starting Current Test****Method(s):**

The appliance was connected to a power-supply circuit protected by a fuse. The appliance was at room temperature at the beginning of the test. The appliance was started three times without tripping an overload protector provided as part of the appliance, or opening the fuse protecting the supply circuit. Each start of the appliance was made under conditions representing the beginning of normal operation – the beginning of the normal operating cycle in the case of an automatic appliance. The motor of the appliance was allowed to come to full speed after each start, and to come to rest between successive starts. An appliance employing a general use receptacle was loaded to the marked rating of the receptacle outlet.

Remark:

The fuse mentioned above was other than a time-delay type. The current rating of the fuse was equal to the current rating of the supply circuit of the lowest rating to which the appliance intended to be connected.

Exception: A time-delay fuse was employed if the appliance is marked "If connected to a circuit protected by fuses, use time-delay fuses with this appliance," or with an equivalent wording and:

- a) The construction of the appliance or the nature of its usage was such that it was used continually on the same branch circuit after installation – for example, a window fan, an attic ventilator, or the like; or
- b) The appliance was of the household type that was used on a 15- or 20- ampere branch circuit.

Result(s):

The appliance started and operated normally without:

- a) Tripping an overload protector provided as part of the appliance; or
- b) Opening the fuse, when connected to a circuit protected by a fuse.

True X
False

Note(s):

- [X] The no-time-delay fuse was 2.5 A.
- [] The time-delay fuse was A.

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 45 **Input Test****Method(s):**

The appliance was operated under conditions of intended service, when connected to a power-supply circuit of maximum rated voltage and rated frequency.

Result(s):

The current input to an appliance was not more than 110 percent of the rated value. True ___ False ___.

Supply Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	Marked Rating (A/W)	Limit (A/W)
120	50	0.368	44.13	0.368	48	52.8
120	60	0.369	44.22	0.369	48	52.8

Note(s):**Conclusion:**

This result (complied / ~~did not comply~~) with the requirements.

Clause 46 **Temperature Test****Test conditions:**

All products:

The sample was connected to a 120 volt, 60 Hz supply and operated under each condition of normal service. If the sample employing a general use receptacle was loaded to the marked rating of the receptacle. The maximum length of the supply cord was used for the Temperature Test. Using thermocouples and a hybrid recorder to record temperatures. The test was continued until temperatures have become constant. If the test was conducted at an ambient temperature other than 25°C (77°F), an observed temperature was corrected.

[X] Fans for use over an eye-level range oven

The appliance mounted above a heat source as described in 46.2.2 and illustrated in Figure 46.1, in accordance with the manufacturer's instructions. The test was conducted with the appliance and heat source in a 2-sided-right side and rear-alcove of 9.525-mm (3/8-inch) thick plywood. The sides of the alcove were painted black and are to extend at least 609.6 mm (2 feet) beyond the outermost edges of the assembly. The appliance and heat source were as close to the side and back of the alcove as their configuration permits. The test was conducted first with the fan on and with only the bake element energized with the thermostat set to give a temperature of 246°C (475°F) with the door of the heat source closed. The test was then repeated with the heat source set for broiling and the door open 101.60 mm (4 inches). Both of these tests were then to be repeated with the fan off.

[X] Controllers

For the temperature test, a separate controller – that was, a controller that was not a physical part of the appliance – that was intended for installation in a wall was mounted as follows. The controller was secured inside its own enclosure, if provided. Otherwise, it was installed inside the smallest standard flush-type outlet box that accommodates it, and the box was mounted in a simulated wall section as illustrated in Figure 46.2.

Result(s):

During the test, the appliance did not:

- a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire;
- b) cause deterioration of any materials employed in the appliance; or
- c) have constant temperature at specific points more than those specified in standard.

True X

False

[X] The thermal protective device did not operate during the temperature test.

True X

False

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 46 Normal Temperature TestsInput: AC120 V, 60 Hz, 0.369 A, 44.22 WLoad: _____ Ambient Temp.: 25 °C**Thermocouple method**

Ch.	Components (or Locations)	Temp. (°C)	Correct Temp. (°C)	Limit Temp. (°C)
1	Lead wire	36.4	--	60
2	Cord bushing	27.2	--	60
3	F1 body	55.4	--	130
4	CD1 body	55.8	--	130
5	PCB near U2	58.1	--	130
6	PCB near C7	54.0	--	130
7	T1 core	56.2	--	130
8	T1 winding	53.1	--	130
9	Internal wire to motor	44.4	--	105
10	Motor winding	58.2	--	105
11	Enclosure, inside, near motor	36.4	--	Ref.
12	Enclosure, outside, near motor	25.0	--	85

Resistance-change Method

Components	R1 (Ω)	T1 (°C)	R2 (Ω)	T2 (°C)	Temp (°C)	Correct Temp (°C)	Limited Temp (°C)
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Clause 47 Dielectric Voltage Withstand Test**Method(s):**

The dielectric potential was applied between the points indicated below. For the test, the sample was at its maximum normal operating temperature and all switches were set so that all circuits were energized. In each case, the test potential was gradually achieved starting from zero and held at the indicated value for a period of one minutes.

The test potential was 1250 VAC (Choice: 1000 V/1000 V plus twice the rated voltage/500 V), 60 Hz or VDC (Choice: 1400 V/1400 V plus 2.8 times the rated voltage/700 V) between:

- ☒ [X] Uninsulated live metal parts and the enclosure. A non-conductive enclosure was wrapped in conductive foil.
- ☒ [X] Terminals of opposite polarity.
- ☒ [X] Uninsulated live metal parts and accessible dead metal parts.
- ☐ [] Uninsulated live metal parts and grounding contacts of grounding type receptacles.
- ☒ [X] Primary and isolated secondary circuits.

- ☐ [] For the capacitors which connected across-the-line or line-to-ground. The test potential was VDC (1414 V plus 2.828 times the maximum rated supply voltage) between the terminals of the capacitor, and between the terminals and foil wrapped around the case of the capacitor. The test was conducted with the capacitor at normal operating temperature.

- ☐ [] For reversible shaded-pole motor. The test potential was V (Choice: 1000 V/1000 V plus twice the rated voltage / 500 V), 60 Hz between the stator winding and the shading coils, the shading coils and the stator core.

Result(s):

In each case, there was no breakdown or arc-over.

True X
False .

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 48**Water Spray Test****N/A****Method(s):**

Refer to standard

Result(s):

There was no wetting of uninsulated live parts or film coated wire – other than motor windings – and no accumulation of water in the wiring compartment or channel. True ____ False ____.

☐ 120 volt cord-connected appliances

Condition	S1	S2	Measured maximum leakage current (mA)	Limit current (mA)
During exposure to the water spray	OFF / ON OFF / ON	P1 P2		2.5
Immediately upon cessation of the water spray	OFF OFF	P1 P2		2.5

There was no breakdown or arc-over of the appliance in the dielectric-voltage withstand test. True ____ False ____.

☐ Other than 120 volt cord connected appliances

The insulation resistance was more than 50,000 ohms.

True ____ False ____.

There was no breakdown or arc-over of the appliance in the dielectric-voltage withstand test.

True ____ False ____.

Note(s):

☐ The insulation resistance was ____ ohms.

Conclusion:

This result (complied / did not comply) with the requirements. _____

Clause 49**Hosedown Test****N/A****Method(s):**

The enclosure and its external mechanisms were sprayed by water from a hose having a 25.4-mm (1-inch) inside diameter nozzle that delivers at least 246 L (65 gallons) of water per minute. The water stream was directed at the fan from a distance of 3 – 3.7 m (10 – 12 feet) and was moved along the enclosure or surface at a minimum rate of 1.6 cm/sec (4 inches per second).

- [] For an enclosure having a test length – height plus width plus depth dimension – of 1.9 m (75 inches) or less, the duration of the water stream contact with the enclosure was 5 minutes.
- [] For an enclosure having a test length exceeding 1.9 m (75 inches), the duration of water stream contact in minutes was 2.6 times the test length measured in meters (the test length measured in inches divided by 15).

Result(s):

There was no standing water inside the enclosure.

True ____ False ____.

There was no water on uninsulated live parts or on film-coated wire, other than motor windings.

True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements. _____

Clause 50**Locked Rotor Test****Method(s):**

The fan was installed or placed in its intended position with the rotor of the fan motor locked and energized as described in the Locked-Rotor or No-Load Temperature Test in the Standard for Impedance Protected Motors, UL 1004-2. The temperature was determined after thermal equilibrium was attained.

Result(s):

The temperature of motor did not exceed the requirements in the Standard for Impedance Protected Motors, UL 1004-2

True X False **Note(s):**

Actual temperature 116.3 °C.

Limit temperature 150 °C.

This test did not need if the motor was conducted the test of UL 1004-2.

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause53 Humidity Conditioning Test**Method(s):**

A sample of the appliance was heated to a temperature just above 34°C (93°F) to reduce the likelihood of condensation of moisture during conditioning. The heated sample was then placed in the humidity chamber and conditioned for 48 hours in air having a relative humidity of 88 ± 2 percent and a temperature of $32 \pm 2^\circ\text{C}$ ($90 \pm 4^\circ\text{F}$).

Following the conditioning:

[X] A cord-connected appliance rated for a nominal 240-volt supply or less

The Leakage Current Test was conducted.

The Dielectric Voltage Withstand Test was conducted.

[] Other than a cord-connected appliance rated for a nominal 240-volt supply or less

The insulation resistance between live parts and exposed dead metal parts was tested.

The Dielectric Voltage Withstand Test was conducted.

Result(s):

[X] A cord-connected appliance rated for a nominal 240-volt supply or less

The leakage current was not more than:

True X

False .

a) 0.5 milliamperes for an ungrounded 2-wire product;

b) 0.5 milliamperes for a grounded, 3-wire, portable product; and

c) 0.75 milliamperes for a grounded, 3-wire, product:

1) Employing a standard attachment plug rated 20 amperes or less; and

2) Intended to be fastened in place or located in a dedicated space.

There was no breakdown or arc-over.

[] Other than a cord-connected appliance rated for a nominal 240-volt supply or less

The insulation resistance was 50,000 ohms or more.

True X

False .

There was no breakdown or arc-over.

True X

False .

Note(s):

[X] The leakage current was 0.03 mA.

[X] The insulation resistance was >200M ohms.

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 54**Strain Relief Test****Method(s):**

☒ Flexible Cord

A flexible cord withstood for 1 minute a direct pull of 155.68 N (35 pounds) applied to the cord with the connections within the appliance disconnected. A 16-kg (35-pound) weight was suspended from the cord and supported by the appliance so that the strain-relief means was stressed from any angle.

A flexible cord withstood for 1 minute a torque as shown in table below in either direction between the cord and the enclosure with the connections within the appliance disconnected.

Weight of appliance, W kg (pounds)	Torque N•m
W < 1.0 (2.2)	0.10 []
1.0 (2.2) ≤ W ≤ 4.0 (8.8)	0.25 []
W > 4.0 (8.8)	0.35 []

☐ Through Cord Switch

A through cord switch withstood for 1 minute a direct pull of 133.44 N (30 pounds).

☐ A metal strain-relief clamp or metal band is used on Type SP-2 or lighter rubber-insulated cord or SPT-1, SPT-2, SVT, or SVTO cord that is protected by varnished cloth tubing or the equivalent under the clamp.

Six samples of the clamp that were secured to the cord in the intended manner were used. Three samples were subjected to the Dielectric Voltage Withstand Test, and conducted strain-relief test specified above as-received condition. Three samples were conducted strain-relief test specified above after being subjected to the following procedures:

- The samples were placed for 168 hours in a forced-draft air-circulating oven maintained at a temperature of 70°C or 10°C higher than the temperature recorded on the clamp during the Temperature Test, whichever is greater.
- The samples were subjected to the Dielectric Voltage Withstand Test, with the value of the applied potential based on the rating of the appliance. The potential was applied between conductors, and also applied between the clamp and all conductors spliced together.
- The conditioned samples were then cooled at room temperature.

Result(s):

☒ Flexible Cord: There was no movement of the cord as to indicate that stress on the connections had resulted.

True ☒ False ☐

☐ Through Cord Switch: There was no conductor that was detached from a terminal or an uninsulated conductor of the cord was exposed.

True ☐ False ☐

☐ The appliance complied with the Dielectric Voltage Withstand Test and the strain-relief test.

True ☐ False ☐

Note(s):

☒ Oven temperature was 70 °C.

☒ Product weight 0.97 Kg.

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause55 Interconnecting Cords and Leads**N/A****Method(s):**

Interconnecting cords or leads withstood for 1 minute a direct pull of 89 N (20 pounds) applied to the cord with the connections within the appliance disconnected. A 9-kg (20-pound) weight was suspended from the cord and supported by the appliance so that the strain-relief means was stressed from any angle.

Interconnecting cords or leads withstood for 1 minute a torque as shown in table below in either direction between the cord and the enclosure with the connections within the appliance disconnected.

Weight of appliance, W kg (pounds)	Torque N•m
W < 1.0 (2.2)	0.10 []
1.0 (2.2) ≤ W ≤ 4.0 (8.8)	0.25 []
W > 4.0 (8.8)	0.35 []

Result(s):

There was no movement of the cord as to indicate that stress on the connections had resulted. True ___ False ___.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 56**Unguarded Impeller Tests****N/A****Method(s):**

A portable fan operated for 1 hour connected to a supply voltage of 130 percent of the rated supply voltage. The test was conducted before and after conditioning as described below. An impeller was placed in an air-circulating oven maintained at 70°C (158°F) for 7 hours. After removal, it was tested as described in Section 56, Unguarded Impeller Tests; Section 61, Impact Test on Guards; and Section 70, Drop Test.

The fan was fixed in place and energized so that the impeller rotated at intended speed. A 3.2 mm (1/8 inch) diameter dry hardwood dowel was supported on a stable, stationary flat surface perpendicular to the plane of rotation. The surface was to have a straight edge located approximately 9.5 mm (3/8 inch) from the fan blade. The dowel was suddenly thrust and retained by hand along an axis perpendicular to the plane of impeller rotation into the blade. This procedure was repeated at different points on the impeller (blade and hub) with the impeller rotating at all intended speeds and from in front of and behind the impeller in order to include the most severe condition.

Result(s):

The impeller did not break, crack, or chip.

True ☐ False ☐.

The motor-driven impeller was energy absorbent to the extent that the dry hardwood dowel did not break.

True ☐ False ☐.

After removal, the fan complied with Section 56, Unguarded Impeller Tests; Section 61, Impact Test on Guards; and Section 70, Drop Test.

True ☐ False ☐.**Note(s):**

130 percent of the rated supply voltage was V, Hz.

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 57**Push Back Relief Test****N/A****Method(s):**

The supply cord or lead was held 25 mm (1 inch) from the point where the cord or lead emerges from the product and then pushed back into the product. When a removable bushing extends further than 25 mm (1 inch) is present, it was removed prior to the test. When the bushing is an integral part of the cord, the test was to be carried out by holding the bushing. The cord or lead was pushed back into the product in 25-mm (1-inch) increments until the cord buckles or the force to push the cord into the product exceeds 27 N (6 pounds-force).

Result(s):

There was no mechanical damage to the supply cord or lead.

True ____

False ____.

There was no exposure of the supply cord or lead to a temperature higher than that for which it is rated.

True ____

False ____.

There was no reduction of spacings below the minimum required values.

True ____

False ____.

There was no damage to internal connections or components.

True ____

False ____.

Note(s):**Conclusion:**

This result (complied / ~~did not comply~~) with the requirements.

Clause 58**Oscillating Fan Test****N/A****Method(s):**

Six samples were subjected to this test. Throughout the test, the appliance was continuously energized at maximum rated input. The movable member was operated so that it would reach the limits of travel in both directions during each cycle by either the integral automatic mechanical feature of the appliance or by a external mechanical arrangement that operates the movable member. The cycling rate was one of the following:

- ☐ 12 cycles per minute;
- ☐ The rate at which the automatic mechanical feature operates, if the rate is less than 12 cycles per minute;
- ☐ Greater than 12 cycles per minute using the external mechanical arrangement, if agreeable to all concerned, or as controlled by the integral automatic mechanical feature.

For an oscillating fan with a tilting head assembly, two samples were oriented in the head fully forward position, two were oriented in the head straight up position, and two were oriented in the head fully back position.

- ☐ 750,000 cycles of operation for an appliance in which the movement of the power-supply cord, electrical wiring, or other insulated live parts occurs as a result of the operation of an automatic mechanical feature.
- ☐ 6000 cycles of operation for an appliance in which the movement of the power-supply cord, electrical wiring or other insulated live parts only as a result of the operation of a manual feature.

After oscillating operation, the samples were conducted the Dielectric Voltage Withstand Test.

Result(s):

- There was no electrical malfunction of the appliance. True ____ False ____.
- There was no exposure of an uninsulated conductor strand either within or outside of the enclosure. True ____ False ____.
- The appliance complies with the Dielectric Voltage Withstand Test. True ____ False ____.
- There was no breakage of more than 10 percent of the strands of any conductor strands (Details, refer to Note). True ____ False ____.
- There was no sign of oscillation cord or wire insulation abrasion. True ____ False ____.

Note(s):

For each conductor:

Conductor 1: Total strands _____ ; Broken strands: _____.

Conductor 2: Total strands _____ ; Broken strands: _____.

Conductor 3: Total strands _____ ; Broken strands: _____.

Conductor 4: Total strands _____ ; Broken strands: _____.

Conductor 5: Total strands _____ ; Broken strands: _____.

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 59**Tests of Switches and Controls****N/A****Method(s):**☐ **Overload**

The appliance was connected to a grounded supply circuit of rated frequency and maximum rated voltage, with the rotor of the motor locked in position. During the test, exposed dead metal parts of the appliance were connected to ground through a 3 A plug fuse, and the connection was such that any single-pole, current-rupturing device was connected in the ungrounded conductor of the supply circuit. If the appliance was intended for use on direct current, or on direct current as well as on alternating current, the exposed dead metal parts were connected so as to be positive with respect to a single-pole, current-rupturing control device. The device was operated at a maximum rate of 10 cycles per minute, except that a faster rate of operation was employed only when agreeable to all concerned.

☐ **Reversing**

The appliance was connected to a circuit of maximum rated voltage. Each cycle of operation was to consist of throwing the switch to the position in which the fan blades rotated in one direction, allowing the blades to come to full operating speed in that direction, then – without paused in any intermediate “off” position unless the switch did not function otherwise – throwing the switch to the position in which the rotation of the blades was reversed, allowing the rotation to attain normal operating speed in that direction, and then reversing the direction of rotation again by throwing the switch to the initial “on” position. The test repeated 1000 cycles.

Result(s):☐ **Overload**

True ____ False ____.

There was no electrical or mechanical breakdown of the device.

The fuse in the grounding connection did not open.

☐ **Reversing**

True ____ False ____.

The motor-reversing switch withstood a test consisting of 1000 cycles of operation.

There was no electrical or mechanical breakdown of the switch, nor pitting or burning of the contacts that impaired intended operation.

Note(s):

The rated frequency and maximum rated voltage was ____ V, ____ Hz.

Motor locked current _____ A

Conclusion:

This result (complied / did not comply) with the requirements.

Clause60**Static Load Test For Mounting Means****N/A****Method(s):**

The appliance was mounted in accordance with the installation instructions provided by the manufacturer on 3/8-inch-thick plasterboard (dry wall) on nominal 2 by 4-inch wood studs/joists spaced on 24 inch (609 mm) centers. The mounting parts were used as specified in the instructions, and the securing screws were located between the studs/joists and secured in the plasterboard.

Commercial/industrial products were mounted in accordance with the installation instructions provided by the manufacturer.

After installation, the appliance was subjected to a static load. The load was applied so as to transmit the maximum amount of stress to the mounting means and was increased during a 5 to 10 second interval, until a load equal to the weight of the product plus a force of 3 times the weight of the product, but not less than 10 pounds (45 N), was applied to the mounting system.

[] For other than Ceiling Insert Fan with tab type mounting means, the load was maintained for 1 minute. Then, the appliance was measured the insulation resistance between live and dead-metal parts, and conducted dielectric voltage withstand test 1 minute of a 60-hertz essentially sinusoidal potential of 1000 volts between live and dead-metal parts.

[] For Ceiling Insert Fan with tab type mounting means, during the installation, the tab mounting means was used and set up in accordance with the instructions; and the load was maintained for 5 minute. Then the displacement was measured 1 minutes after the test load has been removed.

Result(s):

[] For other than Ceiling Insert Fan with tab type mounting means,

The security of the attachment of the appliance to the wall was not adversely affected. True ____ False ____.

There was no evidence of a risk of fire or electric shock. True ____ False ____.

The insulation resistance between live and dead-metal parts was not less than 50,000 ohms. True ____ False ____.

The appliance withstood for 1 minute without breakdown the application of a 60-hertz essentially sinusoidal potential of 1000 volts between live and dead-metal parts. True ____ False ____.

[] For Ceiling Insert Fan with tab type mounting means,

The security of the attachment of the appliance to the wall was not adversely affected. True ____ False ____.

The face of the product secured by the tab mounting means was not permanently displaced more than 1/8 in (3.2 mm) from its original position. True ____ False ____.

Note(s):

Product Weight: ____ kg. Force: ____ N.

The insulation resistance measured was ____ ohms.

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 61**Impact Test on Guards****Method(s):**

The appliance was subjected to an impact of 6.67 N (1.5 foot-pounds) on any surface that was exposed to a blow during intended use. Only one impact was applied at a given point. The impact was produced by dropping a steel sphere, which is 50.8 mm (2 inches) in diameter and weighing approximately 0.54 kg (1.18 pounds), from a height of 381 mm (15 inches). For surfaces other than the top of an enclosure, the steel sphere was suspended by a cord and allowed to swing as a pendulum, dropping through a vertical distance of 381 mm. For the test on a freestanding fan, the fan was to stand in its intended operating position without restraint. Following the impact test, the probe illustrated in Figure 9.1 was used to determine whether a portion of an impeller that presented a risk of injury to persons was exposed.

Deformation of a guard or detachment of a guard or portion of a guard during the impact test was acceptable if the part could readily be restored to its original shape or replaced in the intended manner. After restoration of the guard, the probe illustrated in Figure 9.1 was used to determine whether a portion of an impeller that could cause risk of injury to persons when inserted in any opening of the guard.

[X] The guard also serves as an enclosure, the guard was subjected to the impact test specified above.

[] for outdoor use products, other than portable fan, the appliance shall be cooled a temperature of minus $35.0 \pm 2.0^{\circ}\text{C}$

[] for crawl space or attic mount products, the appliance shall be cooled a temperature of minus 0°C
When While the appliance is still cold, the specimens shall be subjected to the impact test.

Result(s):

A portion of an impeller was not accessible by the test probe illustrated in Figure 9.1. True X
False .

[X] The guard also serves as an enclosure

The impact did not make uninsulated live parts or film-coated wire accessible to contact True X
by the probe specified in Table 10.1, applied as indicated in Section 10, Accessibility of False .
Live Parts.

The impact did not produce a condition that affected the mechanical performance of the True X
equipment. False .

The impact did not produce a condition that increased the risk of electric shock. True X
False .

The impact cracked or dented of the enclosure that did not affect the function of any True X
safety controls or constructional features such as thermostats, overload protective False .
devices, water seals, or strain relief.

Note(s):**Conclusion:**

This result (compiled / ~~did not comply~~) with the requirements.

Clause 62**Static Force Test on Guards****Method(s):**

When a 88.96-N (20-pound) force was applied for 1 minute over a 50.8-mm (2-inch) diameter area to any part of the guard of a portable fan or window fan.

When the 88.96-N force tipped over a freestanding fan, the force to be employed was the value that gave the maximum deflection without tip over. The test was conducted with and without the fan operating and with any adjustments made to provide the greatest resistance to tipping.

Result(s):

The probe shown in Figure 9.1 did not contact a portion of the moving part.

True X

False .

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 63**Impeller Test for Portable Fans****Method(s):**

A 6.35 mm (1/4 inch) diameter steel rod was pushed suddenly into the blade with the fan resting on the floor and operating at maximum speed and rated voltage. A test was made with the rod inserted near the hub, and a second sample was tested with the rod inserted 2/3 of the distance from the hub to the tip of the blade. The rod was to rest on the guard as it was inserted.

When an opening was smaller than 6.35 mm (1/4 inch), use the largest standard diameter steel rod that physically fitted.

Result(s):

A part of the blade was not thrown more than 1.52 m (5 feet) from the closest part of the base of the fan.

True X
False .

Conclusion:

This result (complied / ~~did not comply~~) with the requirements.

Clause 64**Impeller Ignition Test****N/A****Method(s):**

The motor thermal protector was shunted out of the motor winding so that the motor stayed continually energized. The rotor was locked. The fan was positioned as intended in application and was energized in a room ambient temperature of 10 to 40°C (50 to 104°F) at the voltage indicated in Table 40.1. The fan was energized until ultimate results were observed, but no more than 18 days. This procedure was repeated on two additional fan samples.

- ☐ During the test specified above, impeller did not ignite, ended the test.
- ☐ During the test specified above, impeller ignited. Additional test was conducted on three additional fans. A double layer of cheesecloth was to completely cover each fan before the test; and the test described above was repeated.

Remark:

The cheesecloth referenced above was to be bleached, 914.40 mm (36 inches) wide, 28.22 – 30.24 meters per kilogram (14 – 15 yards per pound), and having what was known to the trade as a count of 32 28 – that was, along the two directions parallel to the threads, there were 13 threads per centimeter in one direction and 11 threads per centimeter in the other (32 threads per inch in one direction and 28 threads in the other).

Result(s):

- ☐ The impeller did not ignite and there was no risk of fire for the fan. True ____ False ____.
- ☐ The impeller ignited, but the cheesecloth did not ignite and there was no emission of flame beyond the fan enclosure during the additional test on three additional fans. True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 65**Component Breakdown Test****N/A****Method(s):**

The circuit between any two terminals of a device was opened or shorted. Only one of the simulated fault conditions was imposed at a time. For a multi-terminal device, only two terminals were short-circuited at a time. Simulated circuits were not prohibited from being used, but when the tests performed on simulated circuits indicated damage to other parts of the fan to the extent that the safety of the fan was affected, the tests should be repeated on the fan.

Each test was conducted on a separate sample unless it was agreeable to those concerned that more than one test be conducted on the same sample.

A part of the fan that was removed during routine operation or maintenance was omitted when it results in a more severe test, and the part was not required for the functioning of the equipment; and exposed to view during intended operation.

During these tests, the sample was placed on a softwood surface covered with white tissue paper, and a single layer of cheesecloth was draped loosely over the entire enclosure. Exposed dead-metal parts of the sample were connected to earth ground through a 3 A nontime-delay fuse.

Result(s):

There was no glowing, charring, or flaming of the cheesecloth or tissue paper.

True ____

False ____.

There was no opening of the 3 A fuse.

True ____ False ____.

There was no emission of flame, sparks, or molten metal from the enclosure.

True ____

False ____.

There was no creation of any openings in the enclosure that results in accessibility of live parts.

True ____ False ____.

There was no loss of structural integrity to a degree that the equipment collapses or experiences displacement of parts that lead to short-circuiting or grounding of live parts.

True ____

False ____.

Note(s):

Component opened or shorted	Observations
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Conclusion:

This result (complied / did not comply) with the requirements.

Clause 66**Fuseholder Cover Test**

N/A

Method(s):

One fuseholder is to be tested. Subjected to a force of 36 N (8 lbs) applied for 1 minute to an open cover in any direction that the cover may be removed.

Result(s):

The open cover of a fused attachment plug, or current tap, or similar device, shall not detach from the body of the device.

True ____
False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 70**Drop Test**

N/A

Method(s):

Each of three samples of a fan was dropped through a distance of 914.40 mm (3 feet) to strike a hardwood surface. Each sample was dropped three times. Three samples were employed for the test; however, if the manufacturer so elects, fewer samples may be used in accordance with Figure 70.1.

The hardwood surface was to consist of a layer of 19-mm (3/4-inch) thick tongue-and-groove oak flooring mounted on two layers of 19-mm thick plywood. The assembly rested on a concrete floor during the test.

All samples were supported on a surface 914.40 mm (3 feet) above the hardwood surface. Each sample was dislodged from the supporting surface by a sudden pull applied to the power-supply cord in a plane parallel to the supporting surface and twice by being pushed by a force parallel to the mounting surface applied to the top of the sample, which was placed at the edge of the supporting surface. The sample was oriented differently for each test.

Result(s):

After drop, the probe illustrated in Figure 9.1 was notable to contact a portion of a blade or blower wheel. True ____
False ____.

There is the deformation of a guard or detachment of a guard or portion of a guard during the test. The part (including ribs of a desk fan) can readily be restored to its original shape or a detached guard can be readily replaced in the intended manner. True ____
False ____.

After restoration of the guard, the guard, the probe illustrated in Figure 9.1 was not contact a portion of a blade or blower wheel.

The part of the blade was not thrown more than 1.52 m (5 feet) from the closest part of the base of the fan. True ____
False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 71**Security of Handle Test****N/A****Method(s):**

A handle used to support or carry a fan withstood a force of 4 times the weight of the fan. The force was started at zero and gradually increased so that the force was attained in 5 to 10 seconds and maintained for 1 minute.

- [] When the handle was 76.20 mm (3 inches) or more in width, the force was uniformly distributed over a 76.20-mm width at the center of the handle without clamping.
- [] When the width was less than 76.20 mm, the force was distributed over the entire handle.
- [] When more than one handle was furnished on a fan and the fan could not be carried by only one handle, the force was to be distributed between the handles. The distribution of forces was determined by measuring the percentage of the fan weight sustained by each handle with the fan in the intended carrying position.
- [] When a fan was furnished with more than one handle and could be carried by only one handle, each handle was to sustain the total force.

Result(s):

There was no breakage of the handle, its securing means, or that portion of the enclosure to which the handle was attached.

True ____ False ____.

Note(s):

Product Weight: ____ kg

Force: ____ N

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 72**Stability**

N/A

Method(s):

The appliance was adjusted and operated in any intended manner so that it was most likely to tip over. The test procedure included such items as:

- a) Positioning or removal of casters or feet that do not require a tool for removal;
- b) Operating the fan at maximum speed and then evaluating it in the "off" position;
- c) Adjusting the fan into any intended position; and
- d) Fixing an oscillating type fan at any point in the oscillating cycle of movement.

☒ A cord-connected freestanding appliance placed on a plane inclined 10 degrees from the horizontal.

☐ A pedestal intended for ceiling fan mounting that is 1.68 m (66 inches) high or more and that also weighs 11.34 kg (25 pounds) or more placed as intended on a horizontal surface and subjected to a force of 44.48 N (10 pounds) applied horizontally at a point farthest from the horizontal surface up to a maximum of 1.52 m (5 feet).

☐ A cord connected freestanding appliance that is 2.1 m (6.9 ft) high or more placed as intended on a horizontal surface and subjected to a force of 20 pounds applied horizontally at a height of 1.6 m (62 inches).

Result(s):

The product did not tip over during the test.

True ____

False ____.

Note(s):

Test sample's weight is _____ kg; Height is _____ cm

Conclusion:

This result (complied / did not comply) with the requirements.

Clause 73**Hassock Fan Load Test****N/A****Method(s):**

A hassock fan sustained a 1779 N (400 pound) load uniformly distributed over the top of the fan for 1 minute.

Result(s):

During the test, there was no breakage or cracking of the enclosure or guard.

True ___ False ___.

After the test, the probe illustrated in Figure 9.1 did not contact a portion of the impeller.

True ___ False ___.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 74**Installation Test****N/A****Method(s):**

An appliance intended for permanent connection to a power supply was subjected to an installation test in which the appliance was assembled and installed in accordance with the manufacturer's instructions.

Result(s):

After installation, the appliance functioned in the intended manner and complied with the applicable requirements in Sections 40 – 65. True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 87.1**Temperature test****N/A****Method(s):**

A fan that included or that was intended for use with a solid-state speed control was operated under each of the following conditions:

a) At the speed and rotation direction resulting in maximum motor temperatures. During this test the fan was connected to the load side of a triac. The triac was provided with associated circuitry allowing it to be triggered during each half-cycle of the ac input to the fan. Speed control was accomplished by varying the trigger points.

b) Connected and tested as described in (a) with a 2-volt dc offset potential applied to the ac fan input voltage by a suitable method and with the integral solid-state speed control bypassed. The 2-volt dc offset potential was obtained by using a speed control device having routing diodes and dual triggering circuits to allow independent adjustment of the positive and negative 1/2 cycle triac triggering points. The triggering points were adjusted so that a 2-volt dc bias was measured on the switched ac output waveform. The dc bias may be measured by a dc volt meter having a frequency damped response in the range of 0 – 120 hertz. See Figure 87.1. Alternately, the 2-volt dc offset potential can be obtained by using a power source capable of delivering the proper test voltage along with the 2-volt dc offset.

c) With the fan connected to an ac supply modified to produce half-wave output. The supply was switched from sinusoidal to half-wave output after the fan was operating at maximum speed. This test was conducted in the rotation direction and speed control setting resulting in maximum motor temperatures. If after the supply was switched from sinusoidal to half-wave operation, the fan motor shaft did not continue to rotate in a manner that was a usable normal condition, the locked-rotor temperature requirements described as follow were used instead of the maximum temperature rises specified in Table 46.1.

When the fan motor shaft did not rotate or rotates in a manner not determined to be normal after the supply was switched from sinusoidal to half-wave operation as described in (c) or, the motor did not restart when operated from a half-wave source after the motor was de-energized, the motor shall comply with the applicable temperature requirements of the Locked-Rotor or No-Load Temperature Test requirements in the Standard for Impedance Protected Motors, UL 1004-2 or the Locked-Rotor Temperature Test requirements in the Standard for Thermally Protected Motors, UL 1004-3.

(Refer to the standard for details)

Result(s):

During the test, the appliance did not:

True ____ False ____.

a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire;

b) cause deterioration of any materials employed in the appliance; or

c) have constant temperature at specific points more than those specified in standard.

[] The thermal protective device did not operate during the temperature test.

True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 87.2**Abnormal operation test****N/A****Method(s):**

The motor was installed in the fan, and the fan was installed as described for the temperature test in section 46. The motor was under the locked-rotor conditions (same test method as that of UL1004) and the duration was 15 days.

The power supply was modified to provide half-wave output directly to the motor and bypassing the integral solid-state speed control.

Motor protection type:

☐ Thermally protected motor:

Thermal Protection type:

☐ Thermal cutoff ; ☐ Automatically reset; ☐ Manually reset;

☐ Impedance protected motor;

Result(s):

The fuse in the grounding conductor did not open.

True ____ False ____.

There was no flaming or severe or prolonged smoking.

True ____ False ____.

There was no flaking, embrittlement or charring of the insulation.

True ____ False ____.

There was no electrical or mechanical malfunction of any associated component parts such as capacitors.

True ____ False ____.

The motor was still capable of operating electrically.

True ____ False ____.

There was no dielectric breakdown during the Dielectric Voltage Withstand Test.

True ____ False ____.

Note(s):**Conclusion:**

This result (complied / did not comply) with the requirements.

Clause 91.1**Static Load Test****N/A****Method(s):**

☐ Fans with other than ball-joint hanger means

The mounting means is installed in accordance with the installation instructions provided by the manufacturer. The other parts of the fan are not to be installed. A static load of four times the maximum possible weight of the fan and accessories (including the consideration mentioned in 148.4) is to be gradually applied and then supported for one minute by the installed mounting means.

If the fan is intended to be suspended by a single "J" hook, the above test is conducted:

- a) First with the fan installed as intended and supported by the "J" hook, and
- b) Second with the "J" hook removed and the fan suspended by the chain only.

☐ Fans with ball-joint hanger means

The mounting means is to be mounted in accordance with the manufacturer's instruction using the mounting means provided with the fan. The mounting means is to be subjected to a static load of four times the weight of the fan and all accessories for 7 hours. The load is to be applied so as to transmit the maximum stress to the mounting means. Mounting angle A is to be 30 degrees; however, the mounting angle may be less than 30 degrees, but not less than 10 degrees, if so recommended in the installation instruction. The load angle is to be in the direction of the hanger bracket opening. If the installation of a canopy could affect test results, the canopy is to be installed in accordance with the installation instruction.

Result(s):

After the load was removed, the security of the mounting means to the building structure or outlet box and the security of the connection of the fan to the mounting means were both as originally installed. True ____ False ____.

Note(s):

For a ball-joint hanger means incorporating polymeric material, before the above test, it shall be conditioned according to Clause 91.2.2.

Clause 91.2.2 Temperature condition test**N/A****Method(s):**

Three samples of the polymeric mounting means are to be conditioned for seven hours at 0°C (32°F). For damp or outdoor location ceiling-suspended fans, low temperature conditioning is to be conducted at minus 35.0 ±1.0°C (minus 31 ±1.8°F). The same three samples are then to be conditioned for seven hours in an air-circulating oven maintained at a temperature of 70°C (158°F). The samples are to be cooled to room temperature.

Result(s):

As a result of the conditioning described as above, there was no softening, cracking, warping, or other deterioration that decreases the integrity of the polymeric mounting means.

True ____ False ____.

Note(s):

Clause 91.2.3 Endurance test**N/A****Method(s):**

The same sample of the ceiling-suspended fan, and a sample of the polymeric mounting means that has been conditioned in accordance with 91.2.2.2, are to be mounted in accordance with the manufacturer's instructions. The fan is to be connected to a 60 hertz electrical supply adjusted to the appropriate nominal test voltage specified in Table 40.1. The fan is then to be subjected to 1000 cycles of operation. For a reversible fan, each cycle of operation is to consist of throwing the switch in one direction, allowing the blade to reach full operating speed in that direction; then, without a pause, throwing the switch to the position in which rotation is reversed, allowing the blade to reach full operating speed in that direction. For a unidirectional fan, each cycle of operation is to consist of starting the fan, allowing the blade to reach full maximum operating speed, shutting off the fan, allowing the blade to come to a complete stop.

Result(s):

After being tested as described as above, the means used to prevent rotation or twisting between the fan assembly and the hanger assembly did not be damaged such that it permits rotation or twisting between the assemblies.

True ____ False ____.

Note(s):

Clause 91.3**Polymeric blades test****N/A****Method(s):**

The polymeric fan blades in the as-received condition are to be installed on their corresponding brackets with the flathead screws tightened to a maximum torque of 2.82 N·m (25 lbf·in.).

The polymeric blade with bracket assemblies then is to be conditioned at $0 \pm 1.0^{\circ}\text{C}$ ($32 \pm 1.8^{\circ}\text{F}$) for 7 hours. Following this conditioning, the assemblies are to be allowed to return to room temperature (a minimum of 4 hours).

The assemblies are then to be conditioned at $50.0 \pm 1.0^{\circ}\text{C}$ ($122 \pm 1.8^{\circ}\text{F}$) at a relative humidity of 80 percent for 7 hours and allowed to return to room temperature (a minimum of 4 hours). See 91.3.5. This sequence described in 91.3.3 and 91.3.4 constitutes one cycle.

Immediately following the conditioning described in 91.3.4, before allowing the samples to return to room temperature, the screws are to be tightened to the torque value applied in 99.1.2

The cycle described in 91.3.3 and 91.3.4 is to be repeated twice for a total of 3 cycles.

Result(s):

a) Shall not show any signs of blade cracking including the area around the screwholes;

True ____ False ____.

b) Shall not result in the reduction of the minimum blade height allowed on the final installation due to blade warpage; and

c) Shall not result in unacceptable blade warpage as determined by compliance with the Temperature Test, Section 46, using the entire appliance with the conditioned blade-bracket assemblies installed.

Note(s):

Clause 91.4.1 Static load test for ceiling-suspended fan blade brackets**N/A****Method(s):**

The mounting feet of the blade bracket are to be fixed by a support, vise, or other securing means. The bracket is to be oriented as intended for actual use as illustrated in Figure 91.2. After securing the bracket mounting feet, a crossbar is to be secured across the top of the two outermost blade mounting holes. The load is to be suspended from the center of the crossbar for one minute as illustrated in Figure 91.2. The combined weight of the crossbar, load, and means of load suspension is to be in accordance with Table 91.1.

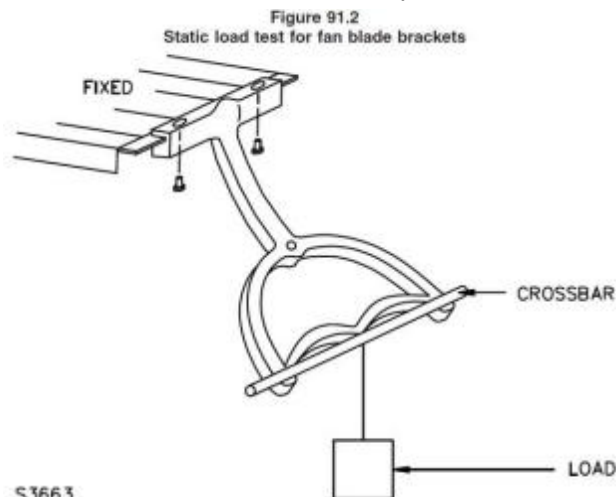


Table 91.1
Static loads for blade brackets

Diameter of ceiling fan ^a	Total static load on sample blade bracket ^b
Less than 1.14 m (45 inches)	9.07 kg (20 pounds)
1.14 m (45 inches) or greater	15.88 kg (35 pounds)

^a Fan blade span.
^b Includes weight of crossbar and means of load suspension.

Result(s):

As a result of the load, the bracket had no cracks as determined by visual inspection with a 4-power magnifying glass. True ___ False ___.

Note(s):

Clause 91.4.2**Dynamic load test for ceiling-suspended fan blade brackets****N/A****Method(s):**

The fan blades and blade brackets are to be installed on the test fan in accordance with the manufacturer's installation instructions. The fan blade length and fan speed are to be considered so as to test the fan and blade combinations that represent the most severe dynamic forces that are induced by the 10 gram (0.022 pounds) imbalance described as below.

A 10 gram (0.022 pounds) flat weight is to be secured to the fan blade that will result in the most change in the vertical distance of the blade imbalance. The weight is to be secured to the fan blade at the outermost point from the center of the fan, but not on the edge of the fan blade.

Then the fan is to be operated at maximum normal speed rpm for 24 hours. A reversible fan is to be operated in the upward airflow direction.

Result(s):

As a result of the test, the bracket shall have no cracks as determined by visual inspection with a 4-power magnifying glass.

True ____ False ____.

Note(s):

Clause 99.1 Polymeric blades test**N/A****Method(s):**

99.1.2 The polymeric fan blades in the as-received condition are to be installed on their corresponding brackets with the flathead screws tightened to a maximum torque of 2.82 N·m (25 lbf·in.).

99.1.3 The polymeric blade with bracket assemblies then is to be conditioned at minus 35.0 $\pm$ 1.0°C (minus 31 $\pm$ 1.8°F) for 7 hours. Following this conditioning, the assemblies are to be allowed to return to room temperature (a minimum of 4 hours).

99.1.4 The assemblies are then to be conditioned at 50.0 $\pm$ 1.0°C (122 $\pm$ 1.8°F) at a relative humidity of 80 percent for 7 hours and allowed to return to room temperature (a minimum of 4 hours). See 99.1.5. This sequence described in 99.1.3 and 99.1.4 constitutes one cycle.

99.1.5 Immediately following the conditioning described in 99.1.4, before allowing the samples to return to room temperature, the screws are to be tightened to the torque value applied in 99.1.2.

99.1.6 The cycle described in 99.1.3 and 99.1.4 is to be repeated twice for a total of 3 cycles.

Result(s):

The polymeric blade-bracket assembly, consisting of a blade attached to the blade brackets, of a ceiling-suspended fan intended for damp locations

True ____ False ____.

- a) Shall not show any signs of blade cracking including the area around the screwholes;
- b) Shall not result in the reduction of the minimum blade height allowed on the final installation due to blade warpage; and
- c) Shall not result in unacceptable blade warpage as determined by compliance with the Temperature Test, Section 46, using the entire appliance with the conditioned blade-bracket assemblies installed.

Note(s):

Clause 114.2 Temperature test for rangehoods**N/A****Method(s):**

Rangehood sample shall be tested with the specified cooking, or shall be tested with a cooking unit which has three 1250 W surface element and one 2100 W surface element, as follows:

- a) The sample shall be mounted and operated with the marked clearance above the cooking surface;
- b) The test shall be conducted in the wooden alcove described in clause 114.2.3; and
- c) The cooking unit shall be operated under the conditions specified in clause 114.2.4..

(Refer to the standard for details)

The sample was connected to a ____ volt, ____ Hz supply and operated under each condition of normal service. If the sample employing a general use receptacle was loaded to the marked rating of the receptacle. The maximum length of the supply cord was used for the Temperature Test. Using thermocouples and a hybrid recorder to record temperatures. The test was continued until temperatures have become constant. If the test was conducted at an ambient temperature other than 25°C (77°F), an observed temperature was corrected.

Result(s):

During the test, the appliance did not:

- a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire True ____ False ____.
 - b) cause deterioration of any materials employed in the appliance True ____ False ____.
 - c) have constant temperature rises at specific points more than those specified in standard. True ____ False ____.
- [] The thermal protective device did not operate during the temperature test. True ____ False ____.

Note(s):

N/A

Load: _____ Ambient Temp.: _____ °C

[illegible]

Components	R1 (Ω)	T1 (°C)	R2 (Ω)	T2 (°C)	ΔT (K)	Limited ΔT (K)

Clause 114.3 Grease conditioning**N/A****Method(s):**

Three samples of a motor are to be completely coated with a minimum 3.2-mm (1/8-inch) thick layer of lard and placed for 30 days in a forced-draft air-circulating oven maintained at a temperature of 150°C (302°F).

After the conditioning,

1. Visual check
2. Dielectric voltage-withstand test, specified in 47.1, except that the potential is to be applied between current carrying parts and aluminum foil wrapped tightly over the motor assembly.
3. Insulation resistance test

Result(s):

At the end of the conditioning

a) There was no noticeable change or deterioration of the motor insulation with respect to accessibility, mechanical strength, or the like. True ____ False ____.

b) There was no dielectric breakdown or arc-over. True ____ False ____.

c) The insulation resistance of the motor is no less than 50,000 ohms between live True ____ False ____.

parts and interconnecting dead metal parts. Charring or discoloration of the insulation is acceptable unless the insulation flakes or rubs off when rubbed with thumb or finger pressure.

Note(s):

Test	Sample No. 1	Sample No. 2	Sample No. 3
Dielectric voltage-withstand test	[] Pass; [] Fail	[] Pass; [] Fail	[] Pass; [] Fail
Insulation resistance test	_____ ohms	_____ ohms	_____ ohms

Clause 114.4 Oven and humidify conditioning**N/A****Method(s):**

Three samples of a motor shall be placed for 7 hours in a forced-draft air-circulating oven maintained at a temperature of 100°C (212°F). At the end of 7 hours, the samples are to be removed from the oven and conditioned for 48 hours in air having a relative humidity of 88 ± 2 percent and a temperature of $32.0 \pm 2.0^\circ\text{C}$ ($89.6 \pm 3.6^\circ\text{F}$). The cycle is then to be repeated.

After the conditioning,

1. Visual check
2. Dielectric voltage-withstand test, specified in 47.1, except that the potential is to be applied between current carrying parts and aluminum foil wrapped tightly over the motor assembly.
3. Insulation resistance test

Result(s):

At the end of the conditioning

- a) There was no noticeable change or deterioration of the motor insulation with respect to accessibility, mechanical strength, or the like. True ____ False ____.
- b) There was no dielectric breakdown or arc-over. True ____ False ____.
- c) The insulation resistance of the motor is no less than 50,000 ohms between live parts and interconnecting dead metal parts. Charring or discoloration of the insulation is acceptable unless the insulation flakes or rubs off when rubbed with thumb or finger pressure. True ____ False ____.

Note(s):

Test	Sample No. 1	Sample No. 2	Sample No. 3
Dielectric voltage-withstand test	[] Pass; [] Fail	[] Pass; [] Fail	[] Pass; [] Fail
Insulation resistance test	_____ ohms	_____ ohms	_____ ohms

Clause 114.5 Grease and humidity conditioning**N/A****Method(s):**

Three samples of a motor are to be conditioned for 48 hours in air having a relative humidity of 88 ± 2 percent at a temperature of $32.0 \pm 2.0^{\circ}\text{C}$ ($89.6 \pm 3.6^{\circ}\text{F}$). After the humidity conditioning, each sample is to be subjected to the grease conditioning specified in 92.2.1.

After the conditioning,

1. Visual check
2. Dielectric voltage-withstand test, specified in 47.1, except that the potential is to be applied between current carrying parts and aluminum foil wrapped tightly over the motor assembly.
3. Insulation resistance test

Result(s):

At the end of the conditioning

- a) There was no noticeable change or deterioration of the motor insulation with respect to accessibility, mechanical strength, or the like. True ____ False ____.
- b) There was no dielectric breakdown or arc-over. True ____ False ____.
- c) The insulation resistance of the motor is no less than 50,000 ohms between live parts and interconnecting dead metal parts. Charring or discoloration of the insulation is acceptable unless the insulation flakes or rubs off when rubbed with thumb or finger pressure. True ____ False ____.

Note(s):

Test	Sample No. 1	Sample No. 2	Sample No. 3
Dielectric voltage-withstand test	[] Pass; [] Fail	[] Pass; [] Fail	[] Pass; [] Fail
Insulation resistance test	_____ ohms	_____ ohms	_____ ohms

Clause 114.9**Glass impact test****N/A****Method(s):**

A test specimen of tempered glass shall be broken by impact to determine the acceptability of the temper of the glass

The test shall be conducted at $25 \pm 5^{\circ}\text{C}$ ($77 \pm 9^{\circ}\text{F}$).

The specimen shall be weighed, and the weight of 10 in² (65 cm²) shall be calculated

The lower surface of the tempered glass specimen shall be covered with adhesive tape to retain the particles when the specimen breaks

The glass shall be placed on a flat surface and shattered with a center punch at a point 1.18 in (30 mm) from the midpoint on the edge of the glass toward the center. The edge shall be defined as the longest dimension on an irregular shape. When shattered, the glass shall completely dice into particles

The 10 largest crack-free particles shall be weighed together within 5 min, to avoid further fracture.

Result(s):

The total weight is less than the calculated weight of 10 in² (65 cm²) of the original specimen. True ___ False ___.

Note(s):

Ambient temperature of test room: _____ °C

Weight of specimen (g)	Acreage of specimen (in ²)	Calculated weight of 10 in ²	Total weight of the 10 largest crack-free particles (g)

Clause 144.1 Normal temperature test**N/A****Method:**

A ceiling insert fan/light combination is to be tested at the voltage described in 46.1.10 and with the lamp connected to a separate supply source to yield maximum marked lamp wattage. The test is to be conducted with the unit installed in a box filled with cellulosic insulation. The test is to be conducted at an ambient temperature of 25 °C (77+/-9°F). The temperatures attained shall not exceed the values specified in Table 46.1.

A ceiling insert fan/light combination is to be mounted in a rectangular box built of 12.7-mm (1/2-inch) thick fir plywood, (a) – (d) grade. The plywood test box is to have dimensions such that each wall is 216 mm (8- 1/2 inches) from the nearest point of the recessed housing, junction box, or incidental projection of the unit and the top edge of each wall is 216 mm above the height of the installed unit. The top of the box is to be open.

A hole is to be provided in the side of the box to permit an exhaust duct or hose of the size recommended in the installation instructions to exit the box. The hose is to be installed parallel to the bottom of the test box and is to be just long enough to reach through the hole. There are to be no bends in the exhaust duct or hose.

The interior space between the plywood box and the exterior surface of the recessed housing is to be filled with loose fill cellulosic insulation(rating: thermal resistance of 3.75 – 3.85 R with a conditioned density of 32.04 – 40.05 kg/m³ (2.0 – 2.5 pounds per cubic foot).

The test is to be conducted under each of the following conditions:

- a) Fan on – Light on
- b) Fan off – Light on

Result:

[] During the test, a thermal protective device connected in the light circuit shall not cycle (nuisance trip). True ____ False ____.

Notes:

The test as above will be combined with section 46, and find the data in the datasheet of section 46.

Clause 144.2**Abnormal test****N/A****Method:****Inherently protected – overlamping**

An inherently protected unit connected to a supply as described in 144.1.1 and installed as described in 144.1.3 – 144.1.10 is to be operated with the largest type and wattage lamp that will physically fit into the unit with the trim and diffuser installed and positioned as intended. The test is to be conducted in the fan off-light on condition. The temperatures attained on parts of the unit in contact with combustible materials (for example, insulation, the test box, and unit support surfaces) after 7-1/2 hours of operations shall not exceed 90°C (194°F).

Result:

The temperatures attained on parts of the unit in contact with combustible materials (for example, insulation, the test box, and unit support surfaces) after 7-1/2 hours of operations shall not exceed 90°C (194°F).

True ____ False ____.

Locked-rotor

An ceiling insert fan light combination, inherently protected unit connected to a supply as described in 144.1.1 and installed as described in 144.1.3 – 144.1.10 is to be operated in the locked-rotor condition with the light on and with a lamp of the maximum rated wattage marked on the unit.

Result:

There shall be no emission of flame or molten metal after 7-1/2 hours of operation.

True ____ False ____.

Notes:

Clause 160.1 Input test**N/A****Method(s):**

The sample was operated under conditions of intended service, when connected to a power-supply circuit of maximum rated voltage and rated frequency.

The test shall be conducted on the evaporative cooler:

- a) with the cooler dry, and
- b) when it is using water in the intended manner

Result(s):

The current input to an appliance was not more than 110 percent of the rated value. True ____ False ____.

Test condition	Supply Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Marked Rating (A/W)	Limit (A/W)
With cooler dry						
With water filled						

Note(s):

Clause 160.2 Temperature test (with conjunction to Clause 46)**N/A****Method(s):**

The sample was connected to a ____ volt, ____ Hz supply and operated under each condition of normal service. If the sample employing a general use receptacle was loaded to the marked rating of the receptacle. The maximum length of the supply cord was used for the Temperature Test. Using thermocouples and a hybrid recorder to record temperatures. The test was continued until temperatures have become constant. If the test was conducted at an ambient temperature other than 25°C (77°F), an observed temperature was corrected.

The above test shall be conducted on all evaporative coolers with the cooler dry, and also be conducted on an evaporative cooler employing a mechanical pump driven by the fan or blower motor when the cooler is using water in the intended manner.

Result(s):

During the test, the appliance did not:

True ____ False ____.

- a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire;
- b) cause deterioration of any materials employed in the appliance; or
- c) have constant temperature rises at specific points more than those specified in standard.

[] The thermal protective device did not operate during the temperature test.

True ____ False ____.

True ____ False ____.

Note(s):

Clause 160.2 Normal Temperature Tests

N/A

Input: _____ V, _____ Hz, _____ A, _____ W

Load: _____ Ambient Temp.: _____ °C

Thermocouple method

[illegible]

Resistance-change Method

Components	R1 (Ω)	T1 (°C)	R2 (Ω)	T2 (°C)	ΔT (K)	Limited ΔT (K)

Clause 160.3 Moisture resistance test**N/A****Method(s):**

The evaporative cooler is to be operated for 24 hours in cycles of 15 minutes “on” and 45 minutes “off”, with water circulating through it in the intended manner. Following the final cycle of 24 hours, the appliance shall be subject to the following tests immediately:

☐ for cord-connected appliance rated for a nominal 120 V supply, leakage current test required in clause 41.1, except that the test is to be discontinued when the leakage current stabilizes

☐ for appliance other than above one, insulation resistance shall be measured

Dielectric voltage withstand test, in which 1000 volts (60 hertz) between live parts and interconnected dead-metal parts

Result(s):

☐ The sample complied with the requirement of leakage current test. True ____ False ____.

☐ As measured, the insulation resistance is not less than 50,000 ohms. True ____ False ____.

The sample could withstand the 1000 volts test voltage without breakdown for 1 minute. True ____ False ____.

Note(s):

☐ for the leakage current test, the measured maximum leakage current is _____ mA;
and the limit is _____ mA for this type of appliance

☐ for insulation resistance test, the measured insulation resistance is _____ ohms.

Clause 160.4 Stability test (with conjunction to clause 54)**N/A****Method(s):**

The appliance shall be placed on a plane inclined 10 degrees from the horizontal and adjusted and operated in any intended manner so that it was most likely to tip over. The test procedure included such items as:

- a) Positioning or removal of casters or feet that do not require a tool for removal;
- b) Operating the appliance at maximum speed and then evaluating it in the "off" position;
- c) Adjusting the appliance into any intended position; and
- d) Fixing an oscillating type fan at any point in the oscillating cycle of movement.

Result(s):

The appliance did not tip over during the test.

True ____ False ____.

Note(s):

Clause 160.6 Overflow test**N/A****Method(s):**

The appliance shall be connected to a water supply as intended.

☐ With any provided timer switch functioning as intended, a provided float- or pressure operated fill switch shall be defeated and the product started. The fill shall be continued for an additional 15 minutes following the first evidence of overflow of the reservoir. If a timer switch is provided, it should be allowed to cycle as intended for the duration of the test and the test shall be continued for 7 hours.

☐ A timer switch, if provided, shall be defeated and the product started. If no automatic shutoff means is provided, the fill shall be continued for an additional 15 minutes following the first evidence of overflow of the reservoir. If a float- or pressure-operated switch is provided as an automatic shutoff means, actuation of the fill switch to terminate the fill will also terminate the test.

☐ If both a timer switch and a float- or pressure-operated fill switch are provided, the devices shall each be defeated independently as described above.

☐ If the product is not provided with a timer or a float- or pressure-operated fill switch; that is, the water source is intended to be controlled manually, the product shall be started and the fill shall be continued for an additional 15 minutes following the first evidence of overflow of the reservoir.

Following above conditioning, the below check and tests shall be conducted immediately:

1. Visual check

2. ☐ for cord-connected appliance rated for a nominal 120 V supply, leakage current test required in clause 48.4.1-48.4.6.

☐ for appliance other than above one, insulation resistance shall be measured, as required in clause 48.5.1

Dielectric voltage withstand test, as required in clause 48.6.1.

Result(s):

There is no wetting of uninsulated live parts or film coated wire, other than motor winding, and no accumulation of water in an electrical enclosure.

True ____ False ____.

☐ The sample complied with the requirement of leakage current test.

True ____ False ____.

☐ As measured, the insulation resistance is not less than 50,000 ohms.

True ____ False ____.

The sample could withstand the 1000 volts test voltage without breakdown for 1 minute.

True ____ False ____.

Note(s):

☐ for the leakage current test, the measured maximum leakage current is _____mA; and the limit is _____mA for this type of appliance

☐ for insulation resistance test, the measured insulation resistance is _____ohms.

Clause 160.7**Spill test****N/A****Method(s):**

The evaporative cooler is to be positioned as intended in use. The water reservoir is to be filled to capacity with water and then an additional four hundred-forty-four milliliters (15 oz) of water are to be poured into the reservoir at a rate of approximately 30 mL/s (1 oz per second).

With 30 minutes after the above conditioning, the below check and tests are conducted.

1. Visual check
2. ☐ for cord-connected appliance rated for a nominal 120 V supply, leakage current test required in clause 48.4.1-48.4.6.
☐ for appliance other than above one, insulation resistance shall be measured, as required in clause 48.5.1
3. Dielectric voltage withstand test, as required in clause 48.6.1.

Result(s):

There is no wetting of uninsulated live parts or film coated wire, other than motor winding, and no accumulation of water in an electrical enclosure.

True ___ False ___.

☐ The sample complied with the requirement of leakage current test.

True ___ False ___.

☐ As measured, the insulation resistance is not less than 50,000 ohms.

True ___ False ___.

The sample could withstand the 1000 volts test voltage without breakdown for 1 minute.

True ___ False ___.

Note(s):

☐ for the leakage current test, the measured maximum leakage current is _____mA;
and the limit is _____mA for this type of appliance

☐ for insulation resistance test, the measured insulation resistance is _____ohms.

Clause 160.8**Static loading test****N/A****Method(s):**

The unit is to be installed in a simulated window frame in accordance with the manufacturer's instructions and with the mounting hardware supplied by the manufacturer, including any brackets or bracing intended to support the rear edge of the unit. The water reservoir shall be filled with the maximum amount of water allowed by the construction of the unit. A load per Table 160.1 acting vertically downward shall be applied along the edge parallel with and farthest from the plane of the window.

In this test, a 5 inch (127 mm) wide channel or equivalent is to be placed flat across the top of the outer enclosure of the unit with one edge of the channel flush with the outer edge of the enclosure. Equal weights are to be suspended on wire ropes attached to the center of the channel on either side of the unit.

Result(s):

The evaporative cooler withstood the test without collapse of the cabinet, base, or the supporting means, and did not fall out of the test window. True X
False .

Note(s):

Clause 191.2 Input Test**N/A****Method(s):**

The fan is operated under conditions of intended service, when connected to a power-supply circuit of maximum rated voltage and rated frequency (if applicable).

Result(s):

The current input to an appliance was not more than 120 percent of the rated value. True ____ False ____.

Supply Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Marked Rating (A/W)	Limit (A/W)

Note(s):

Clause 191.3 Temperature test (with conjunction to Clause 46)**N/A****Method(s):**

The sample was connected to AC power supply at ___/___ volt, ___/___ Hz, or ___5___ VDC, and operated under each condition of normal service.

Using thermocouples and a hybrid recorder to record temperatures. The test was continued until temperatures have become constant. If the test was conducted at an ambient temperature other than 25°C (77°F), an observed temperature was corrected.

Note: For a multispeed fan, the temperature test is to be conducted at the maximum speed at rated voltage. When a fan is equipped with a temperature sensing speed control, the temperature test is to be conducted at the lowest ambient temperature required to attain maximum speed.

Result(s):

During the test, the appliance did not:

True ___ False ___.

- a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire;
- b) cause deterioration of any materials employed in the appliance; or
- c) have constant temperature rises at specific points more than those specified in standard.

[X] The thermal protective device did not operate during the temperature test.

True ___ False ___.

Note(s):

N/A

Load: Ambient Temp.: °C

[illegible]

Components	R1 (Ω)	T1 (°C)	R2 (Ω)	T2 (°C)	ΔT (K)	Limited ΔT (K)

Clause 191.4 Dielectric Voltage Withstand Test**N/A****Method(s):**

A low voltage component fan is to withstand for 1 minute without breakdown the application of a 500 volt, 60-hertz essentially sinusoidal potential between the input leads or terminals and dead metal parts, or between the input leads or terminals and metal foil which is wrapped around the hub of the fan.

The test potential was 500 V (Choice: 1000 V/1000 V plus twice the rated voltage/500 V), 60 Hz between:

☒ [X] Between the input leads or terminals and dead metal parts.

☒ [X] Between the input leads or terminals and metal foil which is wrapped around the hub of the fan.

Result(s):

In each case, there was no breakdown or arc-over.

True ___ False ___.

Clause 191.5 Abnormal Operation Locked Rotor Test**N/A****Method(s):**

A low voltage component fan is to be connected to a supply source at rated voltage while placed on a soft wood surface which is to be covered by a single layer of white tissue paper. The fan is to be covered with a single layer of cheesecloth. The fan is to then be operated with the rotor locked for 7 hours and the winding temperature is to be monitored.

Result(s):

- [X] Following the locked rotor test described in 191.5.1, the dielectric voltage withstand test described in 191.4.1 was conducted; True ____ False ____.
- [X] Following the locked rotor test described in 191.5.1, a low voltage component fan with board traces acting as a coil winding shall be inspected for degradation of the printed wiring board as indicated by wrinkling, cracking, blistering, or loosening of any conductor, or any delamination of the base material or bonding layer; True ____ False ____.
- [X] When the stabilized winding temperature does not exceed the temperatures for the class of insulation per Table 46.1. True ____ False ____.
- [X] When the stabilized winding temperature exceeds the temperatures for the class of insulation per Table 46.1, the locked rotor test shall be continued in accordance with 50.3 – 50.7. True ____ False ____.
- [X] When low voltage protected fans are tested according to 50.3 – 50.7, temperatures should be evaluated according to Table 8.1 of the Standard for Thermally Protected Motors, UL 1004-3. True ____ False ____.

Clause 218.2 **Charging input/output test****N/A****Method(s):**

The input to the charger of a battery-operated fan is to be measured while charging a completely discharged battery pack. The input rating of the charger shall not be exceeded.

Result(s):

The input rating of the charger shall not be exceeded.

True ____ False ____.

Supply Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	Marked Rating (A/W)	Limit (A/W)

Note(s):

Clause 218.3**Input test****N/A****Method(s):**

A fully charged sample shall be tested. The unit shall be operated at maximum normal load and the open circuit battery voltage and maximum battery load current shall be measured.

Result(s):

The open circuit battery voltage and maximum battery load voltage and current shall be measured. True X
False .

Load Condition	Voltage (V)	Current (A)	Wattage (W)	Power Factor	Marked Rating (A/W)	Limit (A/W)

Note(s):

Clause 218.4 Temperature test**N/A****Method(s):**

The Temperature Test of Section 46 is to be conducted for a battery powered fan with the requirements in 218.4.2 supplementing the requirements in Section 46, Temperature Test.

A fully charged sample shall be tested.

Result(s):

During the test, the appliance did not:

True ____

a) attain constant temperatures at any point on the fan sufficiently high to result in a risk of fire;

False ____.

b) cause deterioration of any materials employed in the appliance; or

c) have constant temperature at specific points more than those specified in standard.

[X] The thermal protective device did not operate during the temperature test.

True ____

False ____.

Clause 218.4 Temperature test

N/A

Input: _____ V, _____ / _____ Hz, _____ A, _____ W

Load: _____ / _____ Ambient Temp.: _____ °C

Thermocouple method

Ch.	Components (or Locations)	Temp. (°C)	Temp. Rise (K)	Limit Rise (K)

Resistance-change Method

Components	R1 (Ω)	T1 (°C)	R2 (Ω)	T2 (°C)	ΔT (K)	Limited ΔT (K)
--	--	--	--	--	--	--
--	--	--	--	--	--	--
--	--	--	--	--	--	--
--	--	--	--	--	--	--

Clause 218.5 **Charger temperature test****N/A****Method(s):**

The charger temperature test is to be conducted as follows:

[] A fan with the charger integral with the fan is to be operated while charging a fully discharged battery pack until constant temperatures are attained. Temperatures are to be monitored during the entire charging operation so that temperatures in excess of the requirements would be recorded, if any.

[X] For a fan with a separate charger, the charger is to be operated with its accessible output terminals short-circuited until constant temperatures are attained.

Result(s):

There was no temperatures in excess of the requirements

True ____

False ____.

Clause 218.6 Dielectric Voltage Withstand Test**N/A****Method(s):**

With the battery disconnected, a battery powered fan shall withstand for 1 minute without breakdown the application of a 500 volt, 60-hertz essentially sinusoidal potential

[X] Between the battery terminals and dead metal parts, or

[X] Between battery terminals and metal foil which is wrapped around the fan enclosure.

Result(s):

In each case, there was no breakdown or arc-over.

True ____

False ____.

Clause 218.7 Enclosure impact test**N/A****Method(s):**

A non-metallic battery enclosure shall comply with the impact requirements specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C. A 6.8 J (5 ft·lbf) impact value shall apply in the as-received condition. This impact value shall also be used for cold impact testing of batteries intended to be used in [X] cold environments, such as fans mounted in the crawl space or attic and [] outdoor use products.

Enclosure impact testing shall be conducted on the battery enclosure while connected to the fan and while disconnected. Batteries shall be fully charged prior to the test.

Result(s):

After this test, there was no shorting of the batteries, no cracks in the enclosure that would allow the probe of Figure 218.1 to bridge the gap between live parts of opposite polarity, no increased risk of fire. True ____
False ____.

Note(s):

The following parts (Points) were subjected to the impact test:

No. 1 Point: _____ ; No. 2 Point: _____ ; No. 3 Point: _____.

Condition Temperature: _____ °C. Impact value: _____ J.

Clause 218.8**Drop Test****N/A****Method(s):**

Detachable or separable battery packs shall be tested as described in Section 70.

Result(s):

After the test, there was no shorting of the batteries and no cracks in the enclosure which would allow the probe of Figure 218.1 to bridge the gap between live parts of opposite polarity, and no increased risk of fire

True ____

False ____.

Clause 218.9**Locked rotor test****N/A****Method(s):**

A battery powered fan is to be provided with a fully charged battery. The fan/battery assembly shall be placed on a softwood surface which is to be covered by a single layer of white tissue paper. The fan/battery assembly is to be covered with a single layer of cheesecloth. The fan is to then be operated with the rotor locked until ultimate results or the battery is fully discharged.

[] If a circuit component opens during the test, the test shall be conducted two more times on new samples, confirming that the same result will be obtained in each test.

[] For a multispeed fan, the locked rotor test is to be conducted at the maximum speed setting.

Result(s):

The tissue paper or cheesecloth did not ignite during or after the test.

True ____

False ____.

Following the locked rotor test described in 218.9.1, the dielectric voltage withstand test described in 218.6 was conducted;

True ____

False ____.

Winding temperature did not exceed the first hour temperature limits for the class of insulation per Table 41A.1 of Standard for Thermally Protected Motor, UL 1004-3.

True ____

False ____.

Clause 218.10 Abnormal operation**N/A****Method(s):**

The fan with integral batteries or detachable battery pack is to be placed on a softwood surface covered by two layers of tissue paper; and covered by one layer of cheese cloth. The tests are to be conducted with the battery pack fully charged and the on-off switch fully actuated. Following fault conditions applied one at a time.

- [X] The terminals of a removable battery pack with exposed terminals are to be shorted.
- [X] A short is to be introduced in any accessible cord between the fan and charger.
- [X] A short circuit is introduced between the fan and a separable battery pack.
- [X] The polarity of a removable/replaceable battery pack is reversed.

[X] One shot, non-resettable thermal cut-outs and overload devices may operate during the above tests. In this case, the same test is to be repeated two more times, using two additional samples confirming the same result will be obtained in each test.

The conditions above are to be maintained until ultimate results occur, using one fully charged fan or pack. A new sample may be used for each test.

Result(s):

During the tests, there was no charring or burning of the cheesecloth or tissue paper.

True ____
False ____.

Clause 218.11 Battery venting test**N/A****Method(s):**

A fully charged battery pack with all protective devices defeated shall be immersed in a container of non-conductive oil initially at room temperature. The batteries are to then be discharged by short circuiting the battery terminals. Operation shall be continued until ultimate results.

Result(s):

There was controlled venting of the battery

True ____ False ____.

During the tests, there was no rupturing or distortion of the battery case(s).

True ____ False ____.

There was no expulsion of the battery electrolyte.

True ____ False ____.

Clause 223.1 Ozone test**N/A****Method(s):**

A product employing lamps emitting ultraviolet radiation generating wavelengths less than 250 nm shall comply with the ozone test requirements of the Standard for Electrostatic Air Cleaners, UL 867, Sections 40 and 41.

For UL 867:

☒ [X] The product shall be located in accordance with 40.4

☒ [X] Within the test chamber specified in 40.2

☒ [X] In an area where the local airflow across the surface of the product is not greater than 4 inches/s (0.1 m/s) and which has minimum dimensions of 10 feet (3 m) per side and not less than 8 feet (2.4 m) high.

☒ [X] The air stream discharge area shall be determined by measuring the air stream in a plane parallel to and 2 inches (50.8 mm) from the surface of the product air discharge grille. Each ozone sampling point shall be along this plane.

☒ [X] For the sampling points specified in 40.4.1.3 (b)(1) and (2), the air stream discharge shall be divided into equal sized zones so that the number of ozone sampling points equals the number of zones.

The ozone sampling point shall be located in the geometric center of each zone.

Result(s):

The product measured maximum ozone concentration is less than 0.030 parts per million

True ____

False ____.

Clause 223.2**Ultraviolet radiation test****N/A****Method(s):**

The product was energized at rated voltage and the controls (including user movable parts, shields, and guides etc.) were adjusted to the level that results in the greatest amount of ultraviolet light emanating from the product.

The test was conducted in a dark windowless room that has black radiation barriers to minimize reflections and stray light

[X] In the as received condition

[X] After the enclosure impact test of the Standard for Polymeric Materials - Use in Electrical Equipment Evaluations, UL 746C

[X] After the guard impact test of Section 61

[X] After the drop test of Section 70

[X] All removable parts, such as lenses, filters and covers, that are user-serviceable were removed from the product if their removal results in an increase in the amount of ultraviolet radiation exposure to the user.

Result(s):

The product employing ultraviolet lamps did not emit radiation in excess of 0.1 $\mu\text{W}/\text{cm}^2$

True ____

False ____

UL 8750 Test data:

INPUT TEST

Method:

The input current (or wattage, if so rated) of a LED array, module, or package shall be measured at rated input voltage.

The input current (or wattage, if so rated) of a LED controller or driver shall be measured at rated input voltage and supplying rated load.

Remark: _____

Results:

The measured input **wattage/current** was 0.45, which (☒ **did not** / ☐ **did**) exceed the 1.1 x 0.5 (**110% rated value**).

Overall Comments:

This result (☒ **did** / ☐ **did not**) comply with the requirement.

TEMPERATURE TEST

Input: 120 Vac, / Hz, 0.369 A, 44.22 W, / PF

Load: Normal operation

Output (15min): V, A, W. output (end):
V, A, W

Remark: The Infrared Thermometer should be used to determine the hottest point of mounting surface.

Amb. Temp: °C

Result:

Channel	Location	Actual Temp to amb. 25 °C (°C)	Limit (°C)
101	Power cord	34.1	--
102	Cord bushing	28.2	--
103	F1 body	56.7	
104	CD1 body	54.0	--
105	PCB near U2	53.2	--
106	PCB near C7	51.7	--
107	T1 core	56.8	--
108	T1 winding	53.3	--
109	Internal wire to motor	44.5	--
110	Motor winding	55.9	--
111	Enclosure, inside, near motor	36.2	--
112	Enclosure, outside, near motor	26.8	--

Remark:

Overall Comments:This result (☒ did / ☐ did not) comply with the requirement.

TEMPERATURE TEST (Con'd)

Dimmable LED driver shall be tested with below method:

☐ Method 1 - Mains supply: The LED driver shall be operated at rated input voltage directly from the mains supply.

☐ Method 2 - Half-wave rectified supply: The LED driver shall be operated from a source of supply with a single, appropriately rated semiconductor diode in series with the ungrounded conductor of the supply.

☒ Method 3 - Leading edge phase-cut dimmer: The LED driver shall be operated with an adjustable leading edge phase cut dimmer electrically wired in series with the supply. The dimmer shall not contain any components in its output circuitry for waveform smoothing. The dimmer shall produce an output waveform with a variable conduction angle similar to that depicted in Figure 8.1.1. This is to be confirmed by observing the input supply waveform to the LED driver using an oscilloscope. The dimmer shall be adjusted for:

- a) Maximum input current, and
- b) Maximum input power to the LED driver.

☐ Method 4 - When an LED driver is marked or otherwise identified for use only with a specific dimmer, it shall be configured and tested with the dimmer adjusted for:

- a) Maximum input current, and
- b) Maximum input power to the LED driver.

Test methods 1, 2, and 3 (a and b) apply when the LED driver is marked or otherwise indicated by the manufacturer to be dimmable.

Test methods 1 and 4 apply when the LED driver is marked or otherwise indicated by the manufacturer for use with a specific dimmer.

This result (☒ **did** / ☐ **did not**) comply with the requirement.

DIELECTRIC VOLTAGE WITHSTAND TEST

Method:

The unit shall withstand for one minute, the test potential specified in Table below, using the test equipment employed a transformer of 500-VA or larger capacity and have a variable output voltage that is essentially sinusoidal or continuous direct current. The applied potential is to be increased from zero at a substantially uniform rate until the required test level is reached, and is to be held at that level for 1 minute, where V is the maximum AC (rms) voltage between the parts under test. If there is excess capacitive leakage current, the capacitors are permitted to be removed or the test may be conducted using a DC potential at 1.414 times the AC potential.

Applied potential	Circuit location
2V + 1000	Between primary circuits or secondary circuits operating at greater than 70 V peak and accessible dead conductive parts
	Between the primary and secondary of a transformer
	Between PWB traces or other parts operating at different potentials
500 V	Between a secondary circuit operating at no more than 70 V peak and accessible dead conductive parts

Results:

- ✧ The test voltage 1520 V applies between L/N and Enclosure ;
- ✧ There (☒was not/ ☐was) electrical breakdown during the test.

Remark: _____

Overall Comments:

This result (☒did / ☐did not) comply with the requirement.

ABNORMAL TEST - COMPONENT FAILURE TESTMethod:

A unit shall not exhibit a risk of fire or electric shock when a simulated short circuit is imposed on electrolytic capacitors or semiconductor devices.

Each electrolytic capacitor and semiconductor device is to be short circuited, one at a time (one fault per test). Each test shall continue until either the unit is no longer operable, or until conditions are obviously stable (as determined by no visual changes or detectable thermal increase) for at least 30 minutes.

Results:

Component	Action (S/C or O/C)	Results (Rating, Observation)
U2 (1-4)	S/C	The unit normal operation, no damaged, no hazards
U2 (1-8)	S/C	The unit normal operation, no damaged, no hazards
U1 (1-8)	S/C	The unit normal operation, no damaged, no hazards
U1 (9-16)	S/C	The unit normal operation, no damaged, no hazards
C7	S/C	The unit normal operation, no damaged, no hazards
R41	S/C	The unit normal operation, no damaged, no hazards

- ✧ ~~The ground fuse (☐ did not/ ☐ did) open;~~
✧ The cheesecloth (☒ did not/ ☐ did) charred;
✧ There (☒ were not/ ☐ were) emission of flame or molten material from the unit;
✧ There (☒ were not/ ☐ were) ignition or dripping of a compound from the unit;
✧ There (☒ were not/ ☐ were) exposure of live parts that pose a risk of electric shock;
✧ There (☒ were not/ ☐ were) breakdown during the subsequent dielectric voltage withstand test.

Remark: _____

This result (☒ did / ☐ did not) comply with the requirement.

ABNORMAL TEST - OUTPUT LOADING TEST N/AMethod:

A circuit protector provided as part of the unit is to remain in the circuit, and a user replaceable fuse is to be replaced by the largest fuse the fuseholder will accept.

A manually reset protector is to be operated for 10 cycles and the protector contacts shall be operative upon completion of the test. If an automatic reset protector is provided, or the input current is a value other than zero, the test is to be continued for:

- a) 7 hours, or
- b) 15 days if required in accordance with 7.11.2.4.

For units with more than one output, the remaining outputs are to be open circuited or loaded to rated conditions, whichever results in a more severe operating condition.

Each output is to be short-circuited in turn.

Each output is to be overloaded in turn. Each overload condition is to be conducted with the output loaded to a current (IL) equal to the rated current (IR) plus X percent of the difference between the maximum obtainable output current (Imax) and the rated output current (IR). In the tests, the values of X are to be 100, 75, 50, 25, 20, 15, 10, and 5, in that order. If a load current results in continuous operation, further tests need not be conducted. For each test, a variable resistance load is to be adjusted to the required value and readjusted, if necessary, one minute after application of the source of supply.

$$IL = IR + X (I_{max} - IR) / 100$$

$$X = 100, 75, 50, 25, 20, 15, 10, 5$$

Results:

IL				
Results (Rating, Observation)				
IL				
Results (Rating, Observation)				

- ✧ The temperature of the enclosure (☐ did not/ ☐ did) exceed 90°C during short-output test.
- ✧ The ground fuse (☐ did not/ ☐ did) open;
- ✧ The cheesecloth (☐ did not/ ☐ did) charred;
- ✧ There (☐ were not/ ☐ were) emission of flame or molten material from the unit;
- ✧ There (☐ were not/ ☐ were) ignition or dripping of a compound from the unit;
- ✧ There (☐ were not/ ☐ were) exposure of live parts that pose a risk of electric shock;
- ✧ There (☐ were not/ ☐ were) breakdown during the subsequent dielectric voltage withstand test.

Remark: _____

Overall Comments:

This result (☐ did / ☐ did not) comply with the requirement.

50-WATT POINT POWER MEASUREMENT TEST 50W N/AMethod:

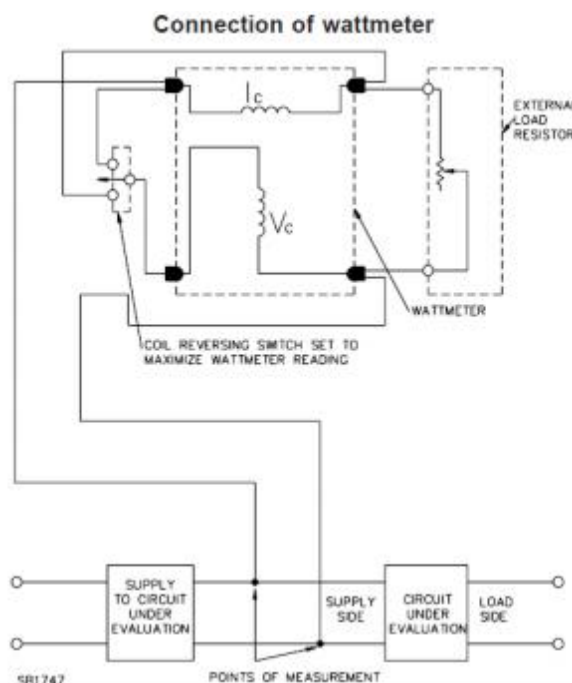
A wattmeter and an adjustable external load resistor are to be arranged as illustrated in Figure below.

The external adjustable load resistor is to be initially set for its maximum resistance. The adjustable resistance is then to be reduced gradually to the point of maximum delivery wattage as indicated by a peak reading on the wattmeter.

For a circuit without a designated current limiting device, a circuit component that opens in less than 1 minute at any power delivery level less than 50 W and that precludes delivery of 50 W for more than one minute is considered to effectively limit the circuit output to less than 50 W, if the test can be repeated two additional times on new samples with comparable results.

For a circuit with a designated current limiting device, a closed shorting switch is to be connected across the current limiting device and the adjustable resistance is then to be reduced to result in a power dissipation of exactly 50 W as indicated by the meter. The switch across the

current limiting device is then to be opened and the time required for the device to open is to be recorded. A current limiting device that opens the circuit in less than 1 minute is considered to effectively limit the circuit output to less than 50 W.

Results:

✧ Refer to the attached circuit diagram for the power point below 50W.

✧ The measured data: _____.

Remark: _____

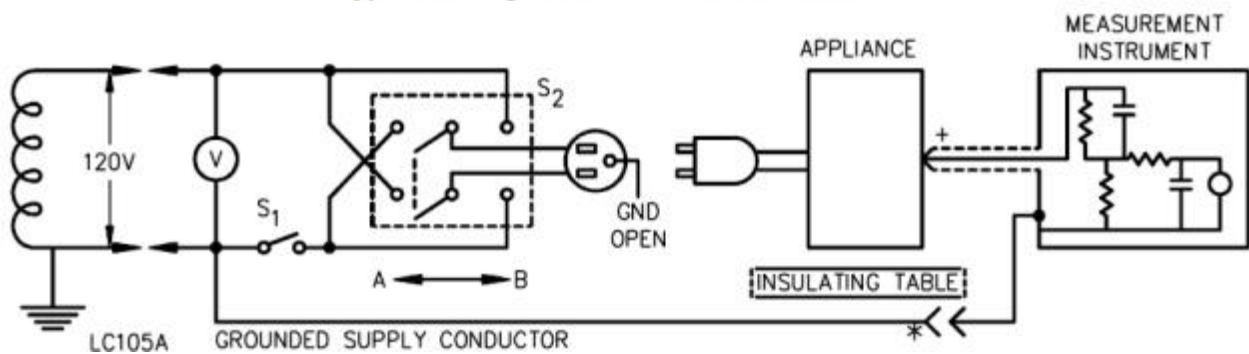
Overall Comments:

This result (☐ did / ☐ did not) comply with the requirement.

LEAKAGE CURRENT MEASUREMENT TESTMethod:

All accessible conductive parts are to be tested for leakage currents. Leakage currents from these parts are to be measured to the grounded supply conductor individually as well as collectively if simultaneously accessible, and from one part to another if they can be readily contacted by one or both hands of a person at the same time. These measurements do not apply to terminals operating at voltages that are not considered to involve a risk of electric shock. If all accessible conductive parts are bonded together and connected to the grounding conductor of the power-supply cord, the leakage current can be measured between the grounding conductor of the product and the grounded supply conductor.

If a conductive part other than metal is used for an enclosure or part of an enclosure, leakage current is to be measured using a metal foil with an area of 10 by 20 cm (4 by 8 in) in contact with the surface. If the conductive surface has an area less than 10 by 20 cm (4 by 8 in), the metal foil is to be the same size as the surface. The metal foil is to conform to the shape of the surface but is not to remain in place long enough to affect the temperature of the product.

Typical leakage-current measurement circuits**Results:**

✧ ☒ For units connected to a supply voltage of 150 volts or less to ground: 0.24 (Limit: $\leq 0.5\text{MIU}$);

✧ ☐ For units connected to a supply voltage of greater than 150 volts to ground: _____ (Limit: $\leq 0.75\text{MIU}$);

Remark: _____

Overall Comments:

This result (☒ **did** / ☐ **did not**) comply with the requirement.

CORD STRAIN AND PUSHBACK RELIEF TEST N/A**Method:**

A flexible cord that relies on a strain relief mechanism to limit the stress applied to internal connections shall be subject to a pulling force of 156 N (35 lbf) applied for 1 min in a direction perpendicular to the plane of entrance into the unit.

Following the pull test, the supply cord is to be gripped 25.4 mm (1 in) from the point where it emerges from the product. When a removable bushing that extends further than 25.4 mm (1 in) is present, it is to be removed prior to the test. When the bushing is an integral part of the cord, the test is to be carried out by holding the bushing. The cord is to be pushed back into the product in 25.4-mm (1-in) increments until the cord buckles, or the force applied exceeds 26.7 N (6 lbf).

A lead wire that leaves the enclosure and that relies on a strain relief mechanism to limit the stress applied to internal connections shall be subject to an applied force of 89 N (20 lbf) or four times the weight of the unit, whichever is less but not less than 22 N (5 lbf), for a period of 1 minute.

Results:

- ✧ The movement of the flexible cord was _____ mm (Limit: ≤ 1.6 mm);
- ✧ There (☒ **was not** / ☐ **was**) movement of a lead wire that indicates stress was applied to internal connections;
- ✧ There (☒ **was not** / ☐ **was**) damage to conductors, connectors, or other components, or loosening of connections inside the enclosure of the unit;
- ✧ There (☒ **was not** / ☐ **was**) exposure of the supply cord or lead wire to temperatures higher than for what they are rated.

Remark: _____

Overall Comments:

This result (☐ **did** / ☐ **did not**) comply with the requirement.

SECURITY OF OUTPUT TERMINALS TEST N/A**Method:**

A wire-binding terminal having fewer threads or lesser thickness than required by 7.4.2.3.5, or that relies upon a lockwasher to prevent turning per 7.4.2.3.6, shall be subject to 100 cycles of conductor connection and disconnection.

The appropriate wires are to be inserted, and the tightening torque specified in Table 8.4 is to be applied for 10 seconds to the terminals. The terminals are then to be loosened fully.

Size of terminal screw		Wire sizes to be tested		Tightening torque	
mm	No.	AWG	(mm ²)	N•m	(lbf•in)
3.5	6	16 – 22	(1.3 – 0.32) ^a	1.4	(12)
4.0	8	14	(2.1) ^b	1.8	(16)
		16 – 22	(1.3 – 0.32) ^a		
5.0	10	10 – 14	(5.3 – 2.1) ^b	2.3	(20)
		16 – 22	(1.3 – 0.32) ^a		

^a Stranded
^b Solid wire

Results:

- ✧ The terminals (☐ did not / ☐ did) turn;
- ✧ The terminals (☐ did not / ☐ did) exhibit any signs of damage.

Remark: _____**Overall Comments:**

This result (☐ did / ☐ did not) comply with the requirement.

INSULATION-PIERCING CONNECTION THERMAL CYCLING TEST N/A**Method:**

Six units shall be assembled to conductors of the size and type for which they are intended. The temperature of the insulation-piercing terminal connections shall be monitored continuously for seven hours while carrying the maximum rated load. The units shall then be subject to 180 cycles at a rate of 3-1/2 hours on and 1/2 hour off (the off-cycle time may be extended for the convenience of measurement), while continuing to monitor the temperatures of the insulation-piercing terminal connections. After the last cycle, the units shall be energized for a period of seven hours, while still monitoring temperatures.

Results:

- ✧ The temperature of the connection at the 1st 7-hour operation: _____ °C (Limit: ≤90 °C);
- ✧ The temperature of the connection at the end: _____ °C (Limit: ≤90 °C);
- ✧ The temperature of 1st 7-hour (☐ **was not** / ☐ **was**) higher than the one of the end.
- ✧ During the testing, the temperature of the connection (☐ **did not** / ☐ **did**) exceed 90 °C.

Remark: _____**Overall Comments:**

This result (☐ **did** / ☐ **did not**) comply with the requirement.

ADHESIVE SUPPORT TEST

Method:

An adhesive relied upon to secure a part to another part shall have sufficient strength to withstand a pulling force equal to five times the weight of the supported part after the conditioning described below.

The adhesive secured parts shall be conditioned at 23°C (73.4°F) for 48 hours. They shall then be placed in an air-circulating oven at the temperature and for the time specified by Table below. The adhesive rating temperature shall be based on results from the temperature test; the associated conditioning time shall be by mutual agreement of the parties.

Adhesive rating, °C	Oven temperature, °C			
	300 h (12.5 d)	720 h (30 d)	1000 h (42 d)	1440 h (60 d)
60	125	115	110	100
75	145	135	125	110
90	160	150	140	130
105	180	170	160	145
130	200	190	180	170
155	220	215	205	195
180	245	235	230	220
200	280	265	255	245
220	295	285	275	265
240	N/A	300	290	280

After conditioning, the sample is to be removed from the oven and allowed to cool to room temperature. A separating force shall then be evenly applied for one minute, perpendicular to the primary axis of the adhesive joint.

Results:

- ✧ The pulling force was 125 N.
- ✧ The parts (☒did/ ☐did not) remain secured together.

Remark: _____

Overall Comments:

This result (☒did / ☐did not) comply with the requirement.

HUMIDITY EXPOSURE TEST

Method:

A unit intended for use in damp or wet locations shall be exposed for 168 hours to moist air having a relative humidity of 88 ± 2 percent at a temperature of $32.0 \pm 2.0^{\circ}\text{C}$ ($89.6 \pm 3.6^{\circ}\text{F}$).

A unit intended only for damp locations is to be subject to the dielectric voltage withstand test.

Results:

✧ There (☒ **could** / ☐ **could not**) withstand the dielectric voltage-withstand test after the conditions.

Remark: _____

Overall Comments:

This result (☒ **did** / ☐ **did not**) comply with the requirement.

WATER EXPOSURE TEST N/AMethod:

A unit intended for use in wet locations shall be subjected to a simulated rain.

After the exposure, outer surfaces shall be dried and the dielectric voltage withstand test shall be repeated.

After the dielectric voltage withstand test, the unit shall be carefully opened to determine if water entered.

During the test the unit is to be oriented in the position that is most likely to result in the wetting of live parts, or in accordance with orientation markings specifically provided for the purpose.

The assembly shall be subjected to the water spray for a total of 4 hours. During the 4 hours the assembly is to be energized and de-energized in the following sequence:

Test duration, h	Test period, h	Operational	Water
0 – 1.0	1.0	On	Off
1.0 – 1.5	0.5	Off	On
1.5 – 3.5	2.0	On	On
3.5 – 4.0	0.5	Off	On

Results:

- ✧ There (☐could/ ☐could not) withstand the dielectric voltage-withstand test after the test.
- ✧ There (☐were/ ☐were not) water in contact with electrical parts.

Remark: _____**Overall Comments:**

This result (☐did / ☐did not) comply with the requirement.

MECHANICAL STRENGTH TESTS FOR METAL ENCLOSURES N/A**Method:**

The enclosure part is to be subjected to a 111 N (25 lbf) for 1 minute. The force is to be applied by means of a steel hemisphere 12.7 mm (1/2 in) in diameter.

The enclosure part is to be subjected to an impact of 6.8 J (5 ft-lb). The impact is to be applied by means of a smooth, solid, steel sphere 50.8 mm (2 in) in diameter and having 535 g (1.18 lb) mass. The sphere is to fall freely from rest through a vertical distance of 1.29 m (51 in).

Results:

- ⊕ There (☐were not/ ☐were) permanent distortion to the extent that spacings are reduced below the requirement;
- ⊕ There (☐were not/ ☐were) transient distortion that results in contact with live parts other than those connected in a Class 2 or LVLE circuit;
- ⊕ There (☐were not/ ☐were) development of openings that expose parts that involve a risk of electric shock or injury.

Remark: _____

Overall Comments:

This result (☐did / ☐did not) comply with the requirement.

DETERMINATION OF LOW-VOLTAGE, LIMITED-ENERGY CIRCUIT STATUS TEST**Method:**

The input to the source under evaluation shall be connected as intended in the end product. The output to the circuit under evaluation shall be connected to a variable resistance load. If the source under evaluation has multiple outputs, all other outputs shall be open-circuited. The output voltage to the circuit under evaluation shall first be measured under open circuit conditions. The variable resistance load on the output under test shall then be adjusted from open circuit to short circuit until an available current of 8 A can be obtained and sustained for one minute of operation. If 8 A cannot be sustained for one minute under any condition of load, the test shall be discontinued.

When a secondary fuse or similar device is used to limit the output current to the circuit under evaluation, it shall be rated as indicated in Table 8.6. Any value may be used for a primary fuse; however, the maximum available output current levels shall be maintained. A fuse replacement marking (voltage and current rating) shall be provided adjacent to any fuse relied upon to limit the output current level.

Table 8.6
Output limiting secondary fuse

Open circuit potential, V_{peak} or DC	Maximum fuse rating, amps
0 – 20	5.0
> 20 – 60	100 / V_{peak} or DC

When a fixed impedance or regulating network is used to limit the voltage and/or current, it shall limit the voltage and current accordingly under any single component fault condition.

Results:

- ✧ The supply source (☒ **did not** / ☐ **did**) exceed:
- a) 8 amps for a voltage up to 42.4 V peak ac or 30 V dc, or
 - b) 150/V amps for a voltage between 30 - 60 V dc.

Remark: _____**Overall Comments:**

This result (☒ **did** / ☐ **did not**) comply with the requirement.

DETERMINATION OF LOW-VOLTAGE, LIMITED-ENERGY CIRCUIT**STATUS TEST (Continued)**

Ambient temperature						°C
No.	component	fault	test voltage (V)	test time	Input current (A)	result
1	U2 (1-4)	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
2	U2 (1-8)	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
3	U1 (1-8)	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
4	U1 (9-16)	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
5	C7	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
6	R41	S-C	AC120V	10mins	0.3	The unit normal operation, no damaged, no hazards
Note: S: Short-circuited; O: Open-circuited; O/L: Overloaded; B: Blocked; L: Locked. Observation: The observations during and after fault condition tests. Damaged: Which component (components) damaged during the fault condition test. Max. Voltage: The maximum accessible voltage of DC output terminal during the fault condition test.						

KNOCKOUT SECURENESS TEST**Method:**

The following test shall apply only to conduit entries and shall be performed on a sample securely held in place using the test apparatus described in Clause 19.23.

A force of 44 N (10 lb) shall be applied to a knockout for 1 min by means of a 6.4 mm (0.250 in) diameter mandrel with a flat end. The force shall be applied to the exterior surface of the knockout, in a direction perpendicular to the plane of the knockout, and at the point most likely to result in movement.

Results:

- ✧ The knockout (☒ **did** / ☐ **did not**) remain in place;
- ✧ The clearance between the knockout and the opening was _____ mm, which (☐ **was not** / ☐ **was**) more than 1.6 mm (0.063 in) when measured after the force has been removed.

Remark: _____

Overall Comments:

This result (☒ **did** / ☐ **did not**) comply with the requirement.

Pictures

Photo 1 Overall view_1 of product (For model LD4480)

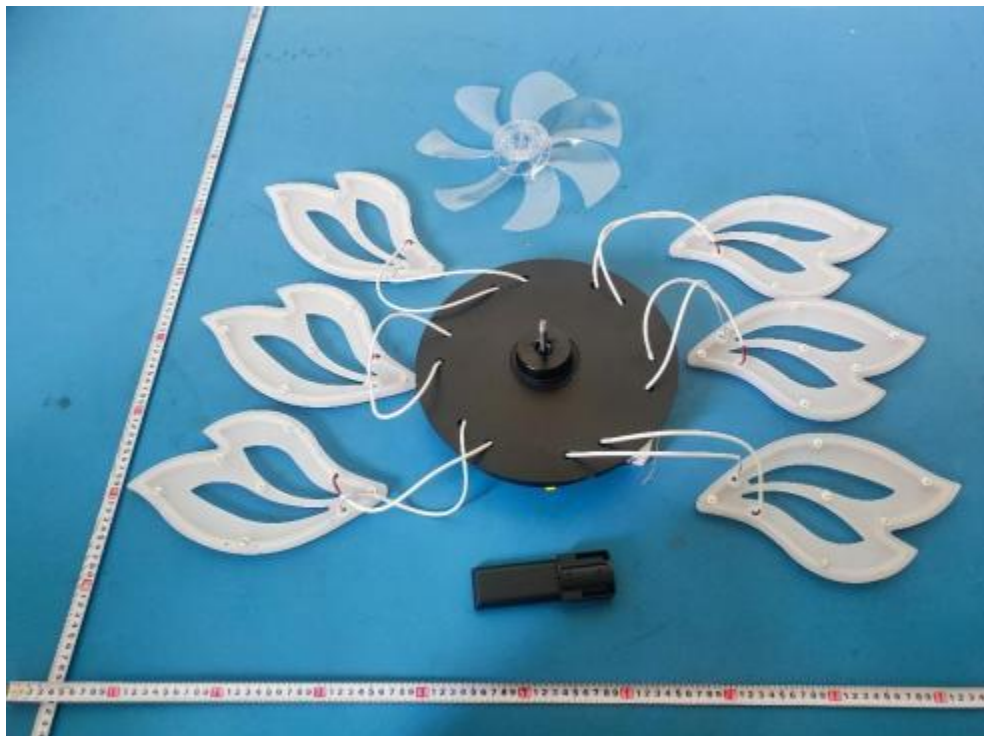


Photo 2 Overall view_2 of product (For model LD4480)

Pictures



Photo 3 Overall view_3 of product (For model LD4480)

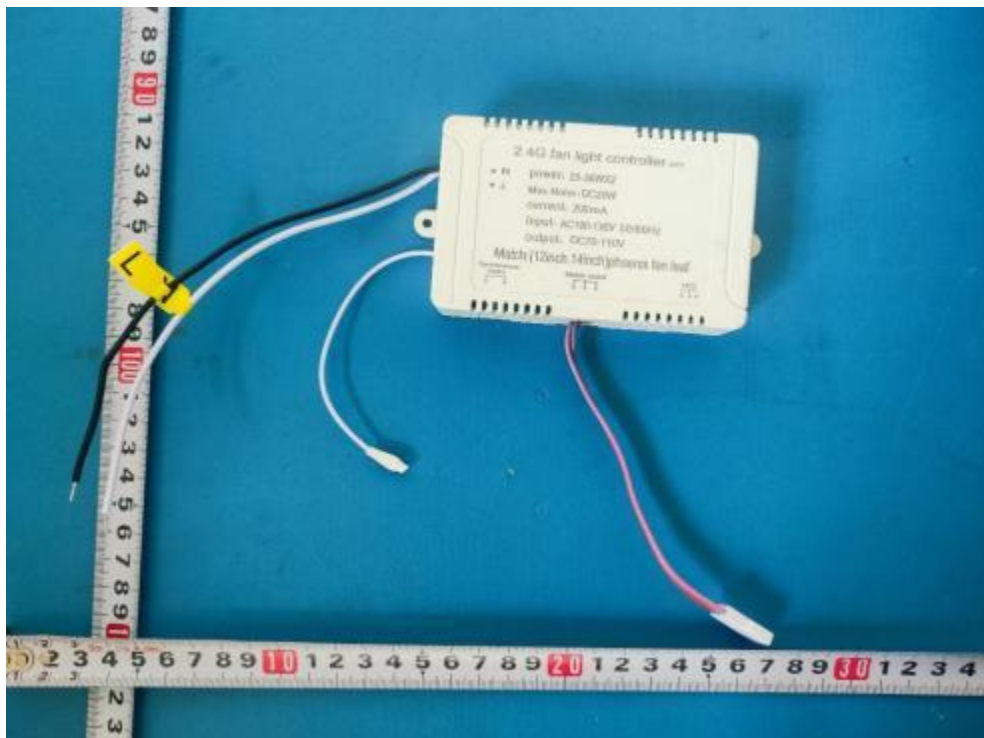


Photo 4 Overall view_4 of product (For model LD4480)

Pictures

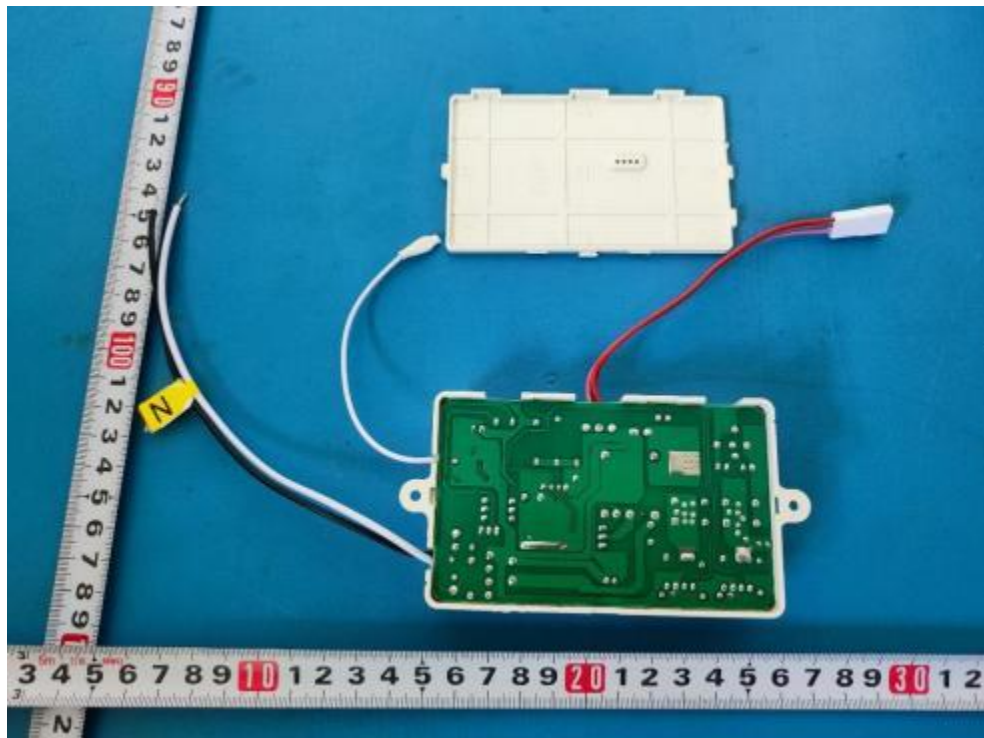


Photo 5 Internal view_1 of product (For model LD4480)

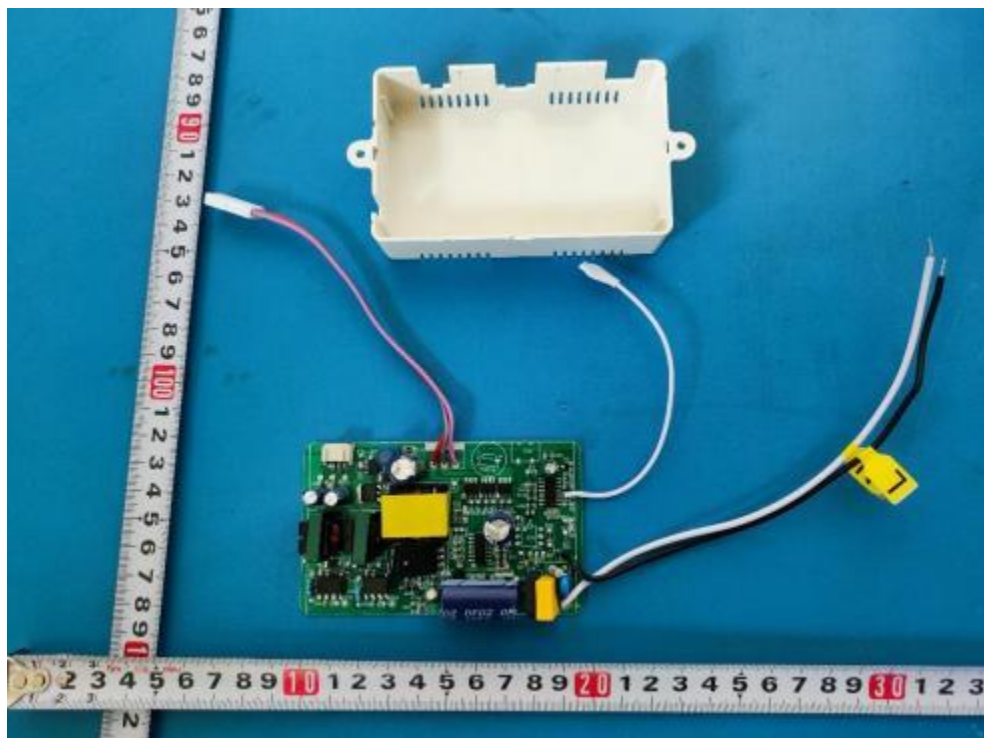


Photo 6 Internal view_2 of product (For model LD4480)

Pictures

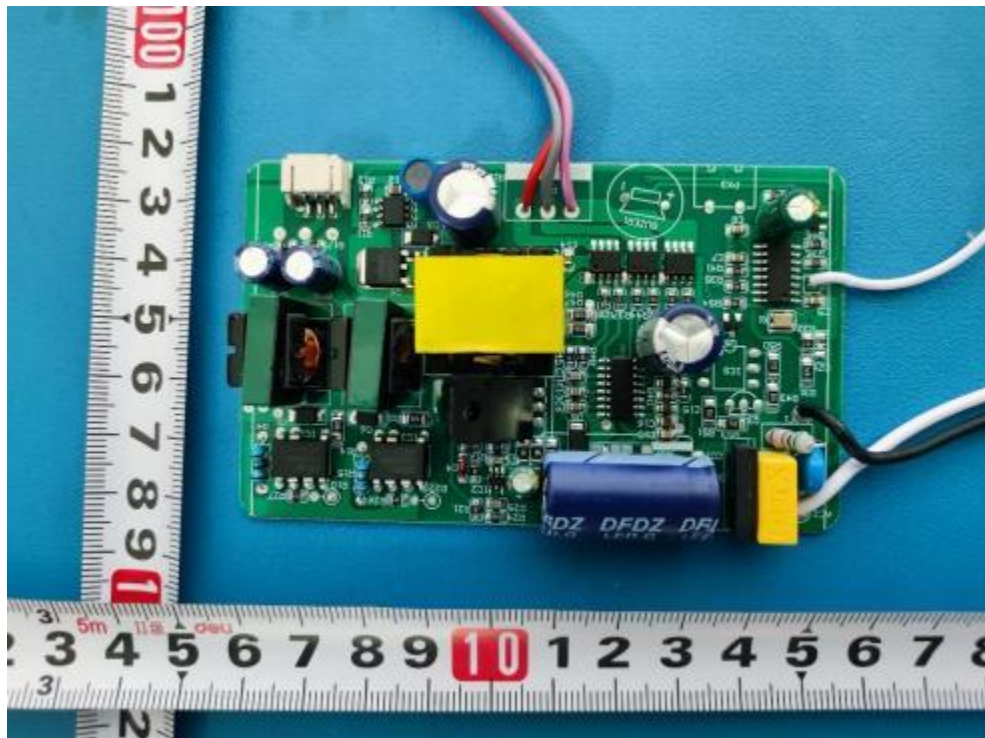


Photo 7 Internal view_3 of product (For model LD4480)

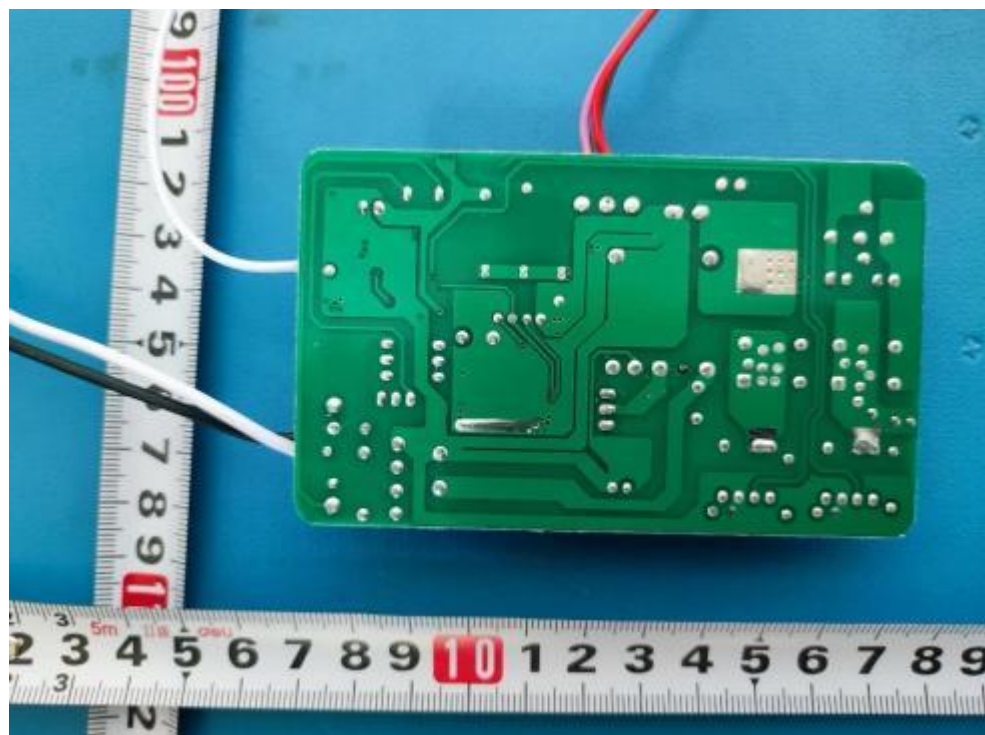


Photo 8 Internal view_4 of product (For model LD4480)

Pictures



Photo 9 Internal view_5 of product (For model LD4480)

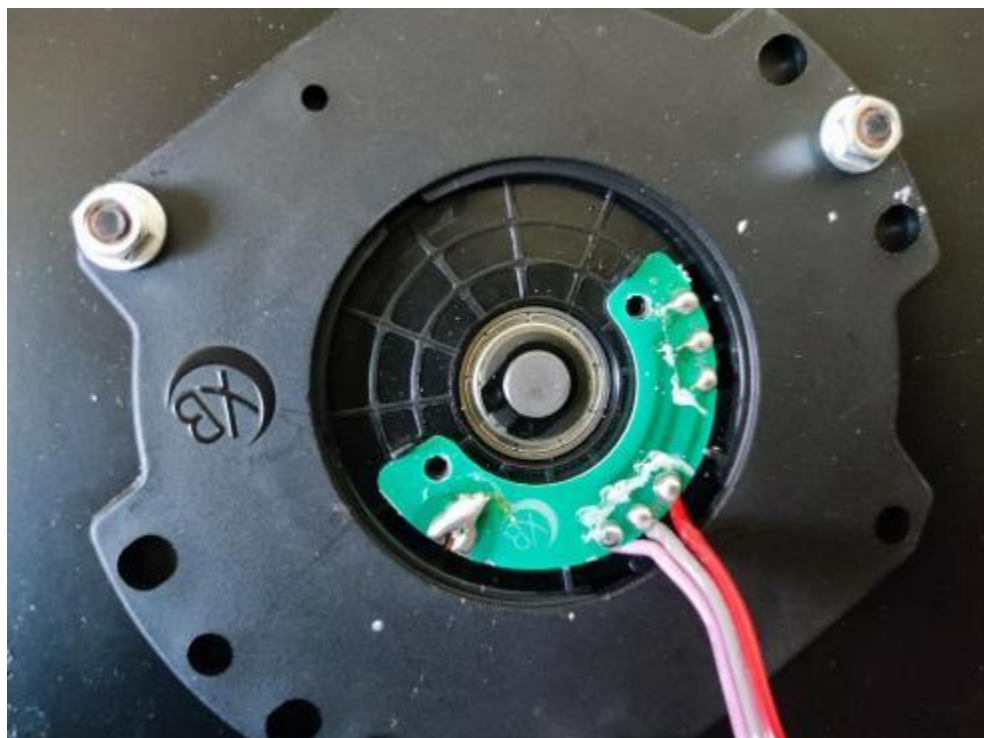


Photo 10 Internal view_6 of product (For model LD4480)

Pictures

Photo 11 Overall view_5 of product (For model 6575005)

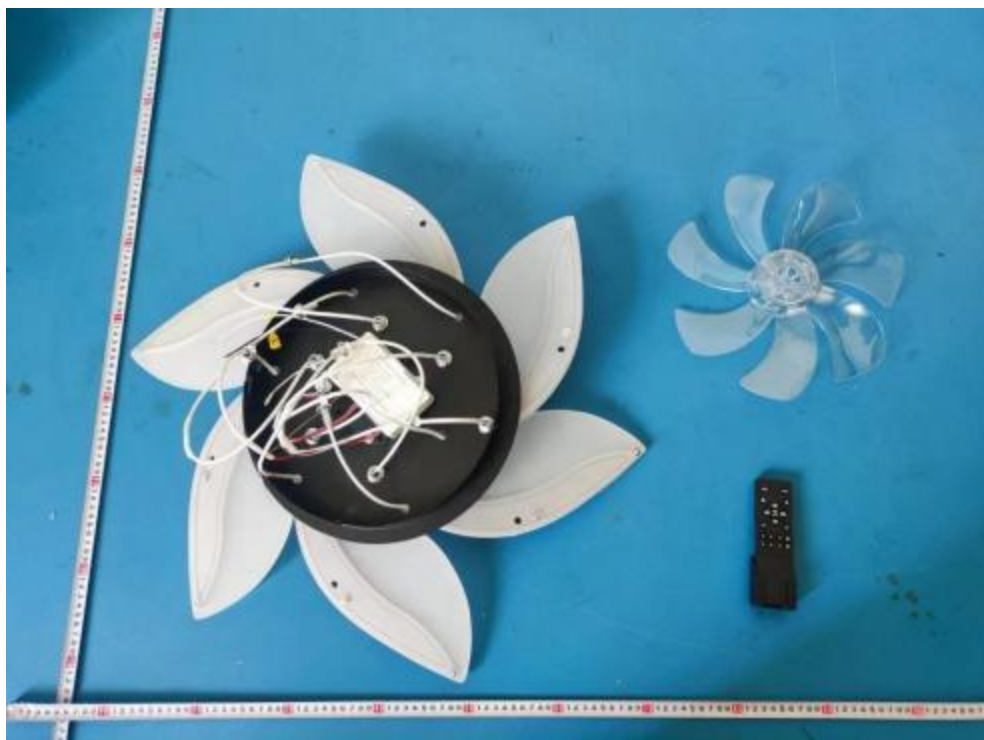


Photo 12 Overall view_6 of product (For model 6575005)

Pictures



Photo 13 Overall view_7 of product (For model 6575007)



Photo 14 Overall view_8 of product (For model 6575007)

Pictures



Photo 15 Overall view_9 of product (For model 6575001)



Photo 16 Overall view_10 of product (For model 6575001)

Pictures



Photo 17 Overall view_11 of product (For model 9365413)

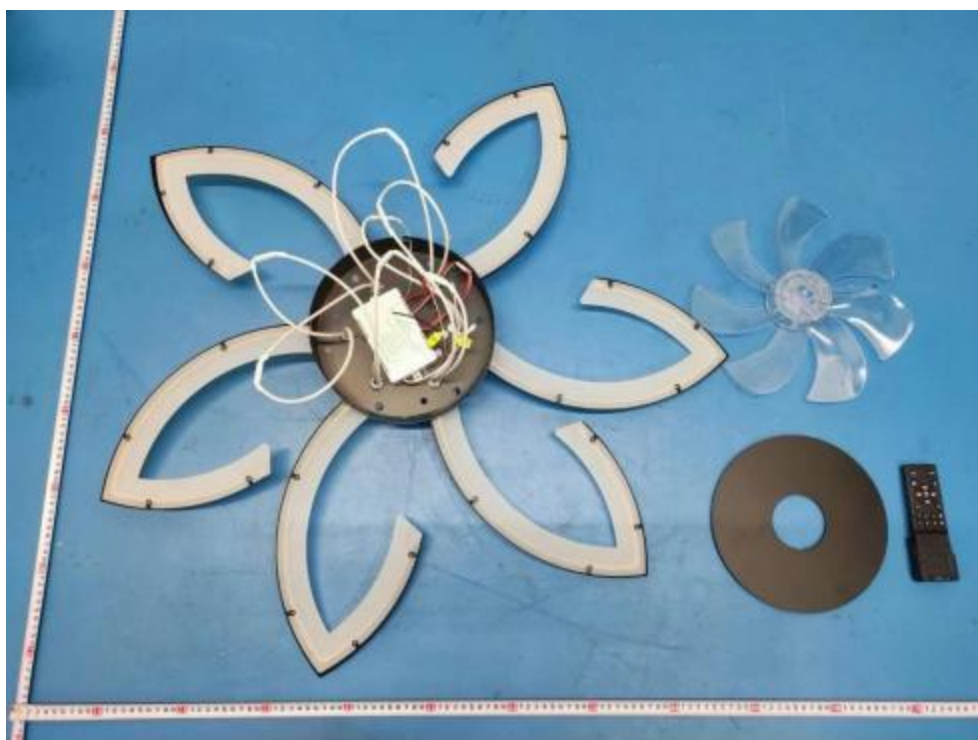


Photo 18 Overall view_12 of product (For model 9365413)

***** **End of Report** *****

Pictures



Photo 19 Overall view_13 of product (For model LD5197)



Photo 20 Overall view_14 of product (For model LD5197)

***** **End of Report** *****

Pictures



Photo 21 Overall view_15 of product (For model LD5197)



Photo 22 Overall view_16 of product (For model LD5197)

***** End of Report *****

Pictures



Photo 23 Overall view_17 of product (For model LD5191)

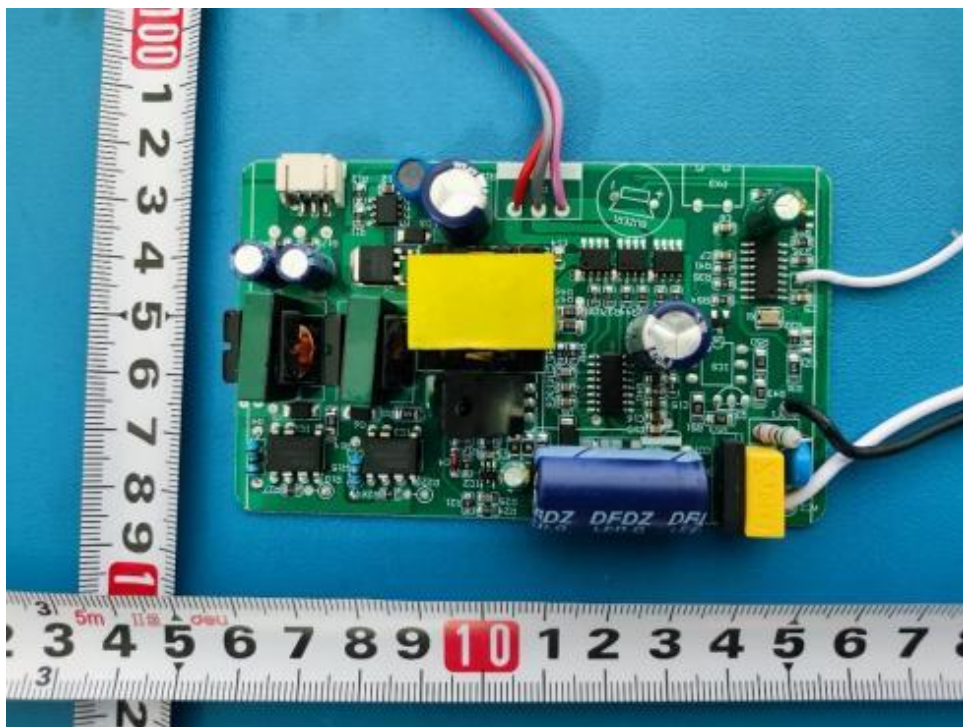


Photo 24 Overall view_18 of product (For model LD5191)

***** End of Report *****

Pictures



Photo 25 Overall view_19 of product (For model LD5193)



Photo 26 Overall view_20 of product (For model LD5193)

***** End of Report *****

Pictures

Photo 27 Overall view_21 of product (For model LD5195)



Photo 28 Overall view_22 of product (For model LD5195)

***** End of Report *****

Pictures



Photo 29 Overall view_23 of product (For model LD5196)



Photo 30 Overall view_24 of product (For model LD5196)

***** **End of Report** *****