TEST REPORT

Kunde: *Client:*	Foshan Rayven Lighting Co., Ltd.
Adresse: *Address:*	A1 New Lighting Source Industry Zone, Luocun, Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Hersteller: *Manufacturer:*	Foshan Rayven Lighting Co., Ltd.
Adresse: *Address:*	A1 New Lighting Source Industry Zone, Luocun, Nanhai District, Foshan city, Guangdong province 528200, P.R. China
Name der Marke: *Brand Name:*	Rayvenlights™
Beschreibungdes Produkts: *Product Description:*	LED Ceiling Light
Modelle: *Models:*	See the model list
Bewertung: *Rating:*	See the model list
Verfahren: *Method:*	Clause 9 of IEC 60598-1:2020
Prüfergebnis*: *Test result*:*	Pass

Datum der Prüfung: *Date of Test:*	**Datum der Emission:** *Date of Issue:*	**Klassifizierung:** *Classification:*	**Gegenstand der Prüfung:** *Test item:*
2024/07/15	2024/07/18	Commission Test	IP44 Test

Prüflabor (Testlabor) / Testing Laboratory:
Shenzhen Southern LCS Compliance Testing Co., Ltd.
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Test von/Test by:	**Check von/**Check by:	**Genehmigt von/**Approved by:
Yeoh Zhang	Torres He	Jesse Liu
Yeoh Zhang/ Project Engineer	Torres He/ Director	Jesse Liu/ Manager

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Modified Information

Version	Report No.	Revision Date	Summary
V1.0	LCSB06174041S	/	Original Version

General product information:

- All models are the same appearance and construction except size and the internal component.
- Unless otherwise specified, the model RAVOLI2400D was chosen as representative model to perform all test.

For all models:220-240V~, 50/60Hz,

Model name	Rating	Size(Φ*H)/mm
RAVOLI2250A	8W/13W	Φ250*55mm
RAVOLI2300A	17W/21W	Φ300*55mm
RAVOLI2400A	21W/30W	Φ400*56mm
RAVOLI2250I	8.5W / 10W	Φ250*55mm
RAVOLI2300I	10W / 15W	Φ300*55mm
RAVOLI2400I	16.5W / 23W	Φ400*56mm
RAVOLI2250B	8W/13W	Φ250*55mm
RAVOLI2300B	17W/21W	Φ300*55mm
RAVOLI2400B	21W/30W	Φ400*56mm
RAVOLI2250J	8.5W / 10W	Φ250*55mm
RAVOLI2300J	10W / 15W	Φ300*55mm
RAVOLI2400J	16.5W / 23W	Φ400*56mm
RAVOLI2250G	8W/13W	Φ250*55mm
RAVOLI2300G	17W/21W	Φ300*55mm
RAVOLI2400G	21W/30W	Φ400*56mm
RAVOLI2250K	8.5W / 10W	Φ250*55mm
RAVOLI2300K	10W / 15W	Φ300*55mm
RAVOLI2400K	16.5W / 23W	Φ400*56mm
RAVOLI2250C	8W/13W	Φ250*55mm
RAVOLI2300C	17W/21W	Φ300*55mm

RAVOLI2400C	21W/30W	Φ400*56mm
RAVOLI2250L	8.5W / 10W	Φ250*55mm
RAVOLI2300L	10W / 15W	Φ300*55mm
RAVOLI2400L	16.5W / 23W	Φ400*56mm
RAVOLI2300D	17W/21W	Φ300*55mm
RAVOLI2400D	21W/30W	Φ400*56mm
RAVOLI2300M	10W / 15W	Φ300*55mm
RAVOLI2400M	16.5W / 23W	Φ400*56mm
RAVOLI2300E	17W/21W	Φ300*55mm
RAVOLI2400E	21W/30W	Φ400*56mm
RAVOLI2300F	17W/21W	Φ300*55mm
RAVOLI2400F	21W/30W	Φ400*56mm
RAVOLI1300H	17W/21W	Φ300*55mm
RAVOLI1400H	21W/30W	Φ400*56mm
RAVOLI1300N	10W / 15W	Φ300*55mm
RAVOLI1400N	16.5W / 23W	Φ400*56mm

Equipment used during test:

ID Number	Instrument	Model/ Type	Calibration Date
SLCS-S-095	Test needle	AGPCD	2024-5-7
SLCS-S-033	Spatter/rush showering equipment	BL	2024-5-6
SLCS-E-027	Temperature and humidity barometer	/	2024-04-24
SLCS-S-072	Torque Driver	26RTD	2024-5-6
SLCS-S-073	Dielectric strength tester	AN9602M	2024-5-6
SLCS-S-062	Variable-frequency power source	AN97020TS	2024-5-6
SLCS-S-059	Digital Power Meter	PF9800	2024-5-6
SLCS-S-011	J Thermocouple	J	2024-4-29
SLCS-S-029	Temperature recorder	34970A	2024-5-7

Test Item:

Tests for protection against dust-proof: IP4X

Test Method:

The tests should be carried out under the standard atmospheric condition.

Temperature range: 20℃ to 30℃

Solid-object-proof luminaires (first characteristic IP numerals 3 and 4) shall be tested at every possible point (excluding gaskets) with a probe in accordance with test probe C or D of IEC 61032, applied with a force as shown in Table 9.1

The end of the probe wire shall be cut at right angles to its length and be free from burrs.

Acceptance Conditions:

After completion of the tests, the luminaire shall withstand the electric strength test specified in Section 10, and inspection shall show:

The test tool with a diameter of 1.0mm does not pass through any opening.

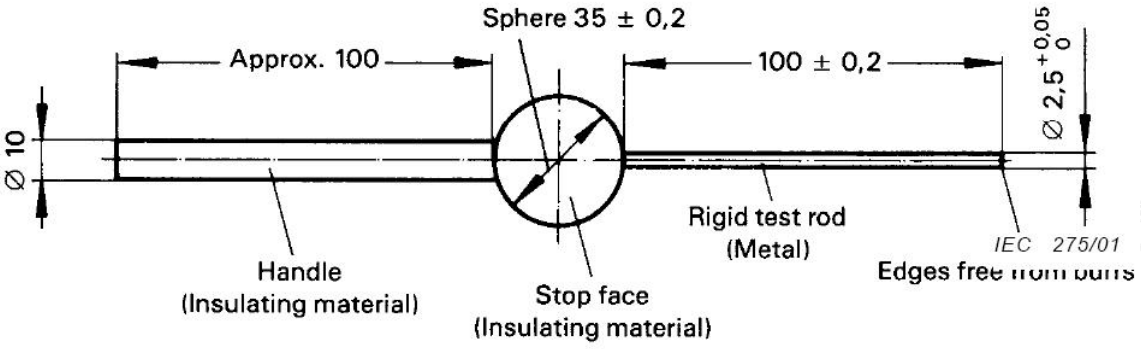
Test Result:

☒ **Pass** ☐ **Fail**

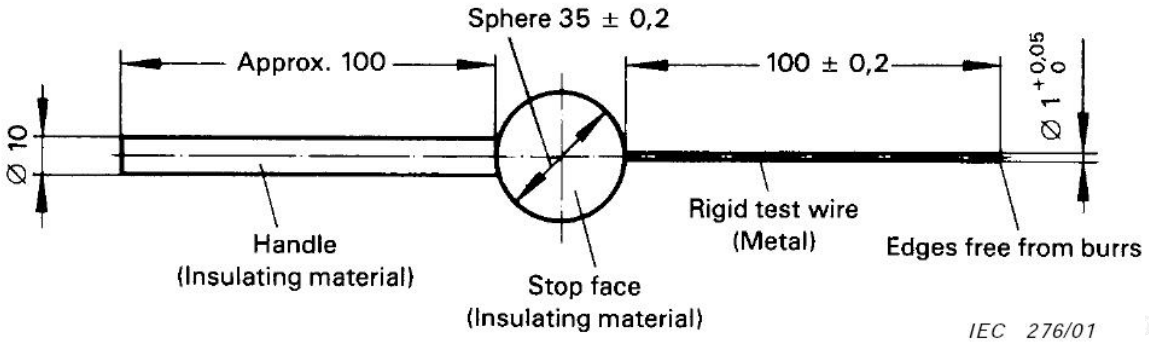
Table 9.1 – Solid-object-proof luminaire test

	Test probe according IEC 61032	Probe wire diameter	Application force N
First IP numeral 3	C	2,5 mm $^{+0,05}_{0,00}$ mm	3 ± 10 %
First IP numeral 4	D	1 mm $^{+0,05}_{0,00}$ mm	1 ± 10 %

Test rod 2,5 mm diameter, 100 mm long



Test wire 1,0 mm diameter, 100 mm long



IEC 276/01

Test Item:

Tests for protection against ingress moisture: IPX4

Test Method:

The tests should be carried out under the standard atmospheric condition.

Temperature range: 20℃ to 30℃

Splash-proof luminaires (second characteristic IP numeral 4) are sprayed from every direction with water for 10 min by means of the spray apparatus shown in Figure 7 and described in 9.2.4.

The luminaire shall be mounted under the pivot line of the tube so that the ends of the luminaire receive adequate coverage from the jets.

The tube shall be caused to oscillate through an angle of almost 360°, 180° on either side of the vertical, the time for one complete oscillation (2 × 360°) being about 12 s. The luminaire shall be turned about its vertical axis during the test at a rate of 1 r/min.

The support for the equipment under test shall be grid shaped in order to avoid acting as a baffle.

After this 10 min period, the luminaire shall be switched off and allowed to cool naturally whilst the water spray is continued for a further 10 min.

Before the tests for the second characteristic numeral, with the exception of IPX8, the luminaire complete with lamp(s) shall be switched on and brought to a stable operating temperature at rated voltage.

The water for the tests shall be at a temperature of 15 °C ± 10 °C.

Luminaires shall be mounted and wired as in normal use and placed in the most unfavourable position, complete with their protective translucent covers, if any, for the tests of IP.

Where connection is made by a plug or a similar device, then this shall be regarded as part of the complete luminaire and shall be included in the tests and similarly for any separate controlgear.

For tests of IP, fixed luminaire intended for mounting with its body in contact with a surface shall be tested with an expanded metal spacer interposed between the luminaire and the mounting surface. The spacer shall be at least equal in overall size to the projection of the luminaire, and have dimensions as follows:

Longway of mesh	10 mm	to	20 mm
Shortway of mesh	4 mm	to	7 mm
Strand width	1,5 mm	to	2 mm
Strand thickness	0,3 mm	to	0,5 mm
Overall thickness	1,8 mm	to	3 mm

Luminaires having provision for draining water by means of drain holes shall be mounted with the lowest drain hole open unless otherwise specified in the manufacturer's installation instructions.

If the installation instructions indicate that a luminaire is for ceiling or under-canopy mounting, the luminaire shall be attached to the underside of a flat board or plate which extends 10 mm beyond that part of the luminaire perimeter in contact with the mounting surface

For recessed luminaires, the parts in the recess and the parts protruding from the recess shall each be tested according to their IP classification as indicated in the manufacturer's mounting instructions. A box encapsulating the part in the recess may be necessary for the test of IP.

Note: Portable luminaires, wired as in normal use, shall be placed in the most unfavourable position of normal use.

Glands, if any, shall be tightened with a torque equal to two-thirds of that applied to glands in the test of 4.12.5.

Fixing screws of covers, other than hand-operated fixing screws of glass covers, shall be tightened with a torque equal to two-thirds of that specified in Table 4.1.

Screwed lids shall be tightened with a torque having a value in newton metres numerically equal to one-tenth of the nominal diameter of the screw thread in millimetres. Screws fixing other caps shall be tightened with a torque equal to two-thirds of that specified in Table 4.1.

Acceptance Conditions:

After completion of the tests, the luminaire shall withstand the electric strength test specified in Section 10, and inspection shall show:

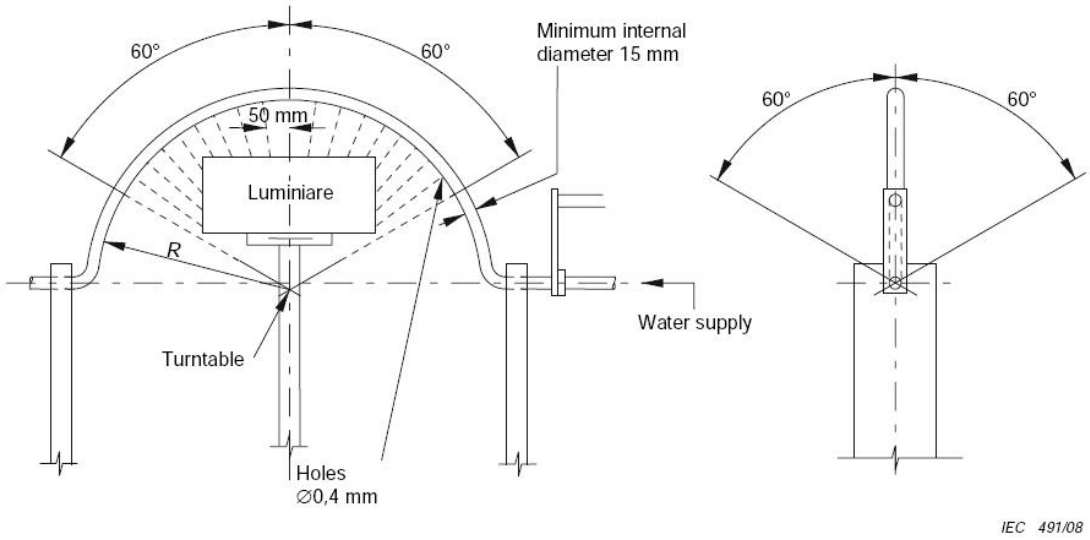
no trace of water on electrical connections, current carrying parts or on insulation where it could become a hazard for the user or surroundings, for example where it could reduce the creepage distances below the values specified in Section 11; the only exception to this is for SELV conductors where the voltage under load does not exceed 12 V r.m.s. or 30 V ripple free d.c. and the conductors are protected from corrosion.

For luminaires without drain holes, there shall be no water entry.

For luminaires with drain holes, water entry including condensation is allowed during the tests if it can drain out effectively and provided it does not reduce the creepage and clearance distances below the minimum levels specified in the standard.

Test Result:

☒ Pass ☐ Fail



	Luminaire protection	
	rainproof	splash-proof
Oscillation half-angle	±60°	±180°
Holes within half-angle	±60°	±90°

Figure 7 – Apparatus for testing protection against rain and splashing

Table 4.1 – Torque tests on screws

Nominal outer thread diameter of screw mm	Torque Nm		
	1	2	3
Up to and including 2,8	0,20	0,40	0,40
Over 2,8 up to and including 3,0	0,25	0,50	0,50
Over 3,0 up to and including 3,2	0,30	0,60	0,50
Over 3,2 up to and including 3,6	0,40	0,80	0,60
Over 3,6 up to and including 4,1	0,70	1,20	0,60
Over 4,1 up to and including 4,7	0,80	1,80	0,90
Over 4,7 up to and including 5,3	0,80	2,00	1,00
Over 5,3 up to and including 6,0	–	2,50	1,25
Over 6,0 up to and including 8,0	–	8,00	4,00
Over 8,0 up to and including 10,0	–	17,00	8,50
Over 10,0 up to and including 12,0	–	29,00	14,50
Over 12,0 up to and including 14,0	–	48,00	24,00
Over 14,0 up to and including 16,0	–	114,00	57,00

Table 4.2 – Torque tests on cable glands

Diameter of test rod mm	Moment	
	Metal cable glands Nm	Moulded plastic cable glands Nm
Up to 7	4,00	2,5
Over 7 up to 14	6,25	3,25
Over 14 up to 20	7,50	5
Over 20	10	7,50

Withstand the electric strength after IP4X test:		
Test Location	Test Voltage	Broken or Flashover
Live parts and accessible parts	2960V	☐Yes ■No
Withstand the electric strength after IPX4 test:		
Live parts and accessible parts	2960V	☐Yes ■No

Photo Documentation:

Photo 1: Overall view of model RAVOLI2400D

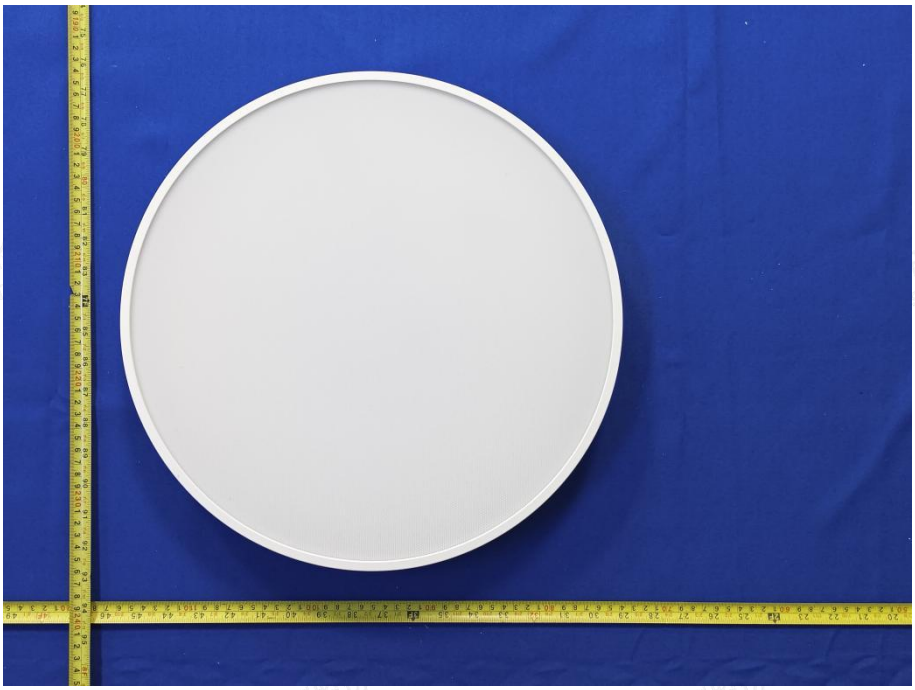


Photo 2: Overall view of model RAVOLI2400D

Photo Documentation:

Photo 3: IP4X test of model RAVOLI2400D

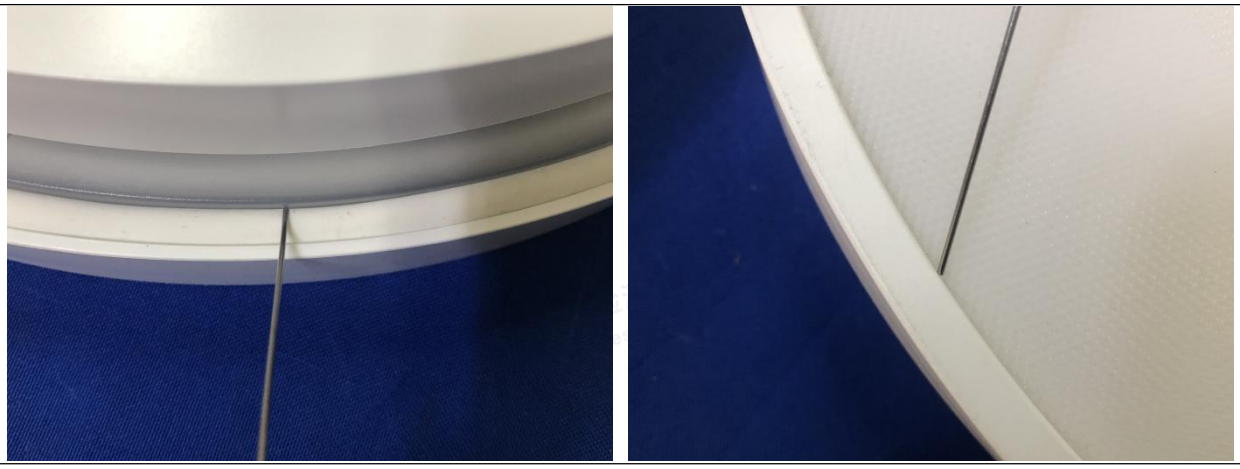


Photo 4: IPX4 test of model RAVOLI2400D

Photo Documentation:

Photo 5: Test result of IP4X and IPX4 test

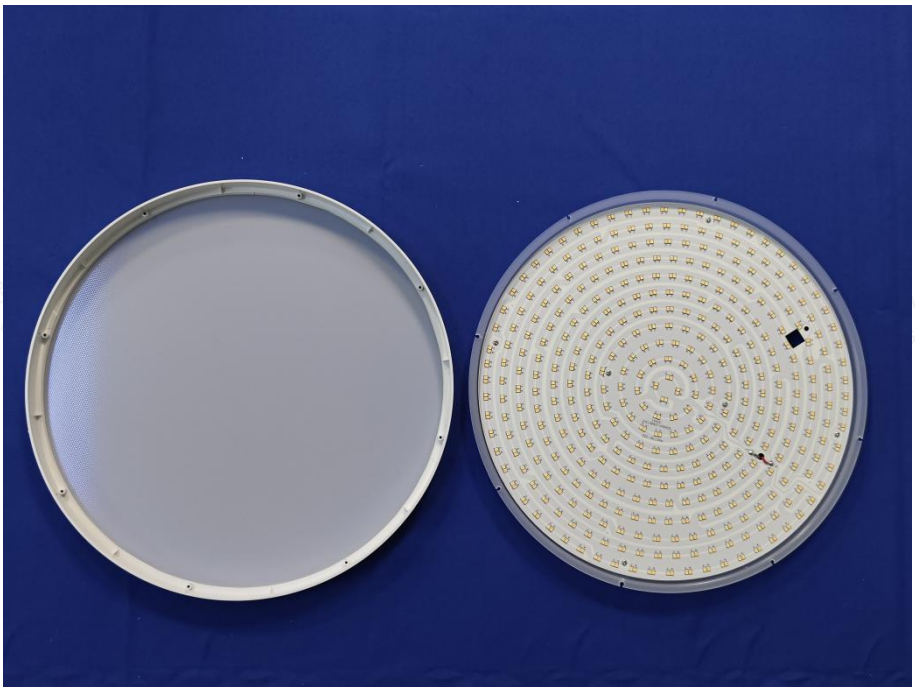


Photo 6: Test result of IP4X and IPX4 test

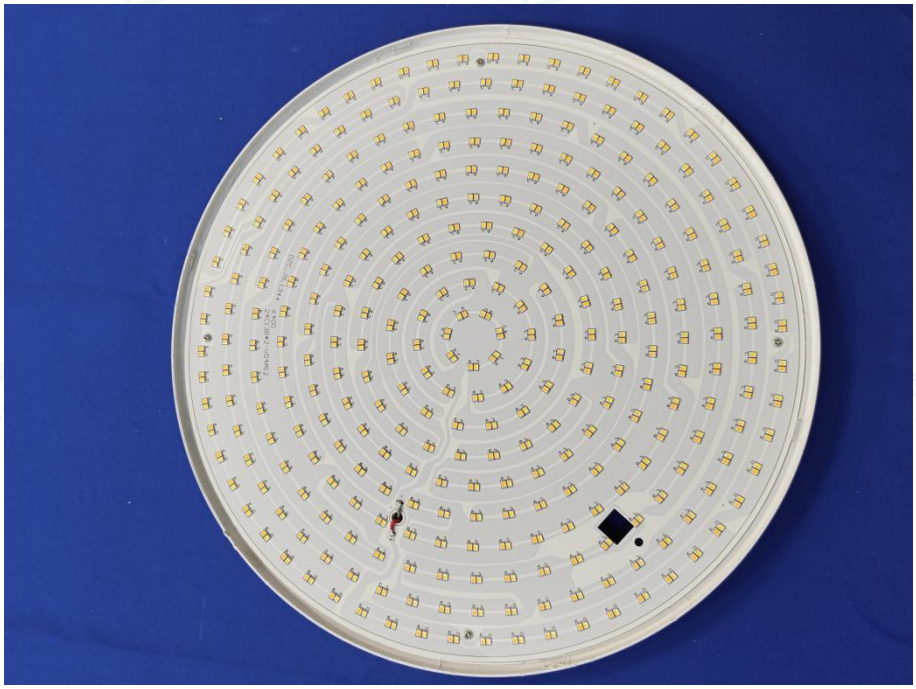


Photo Documentation:

Photo 7: Test result of IP4X and IPX4 test

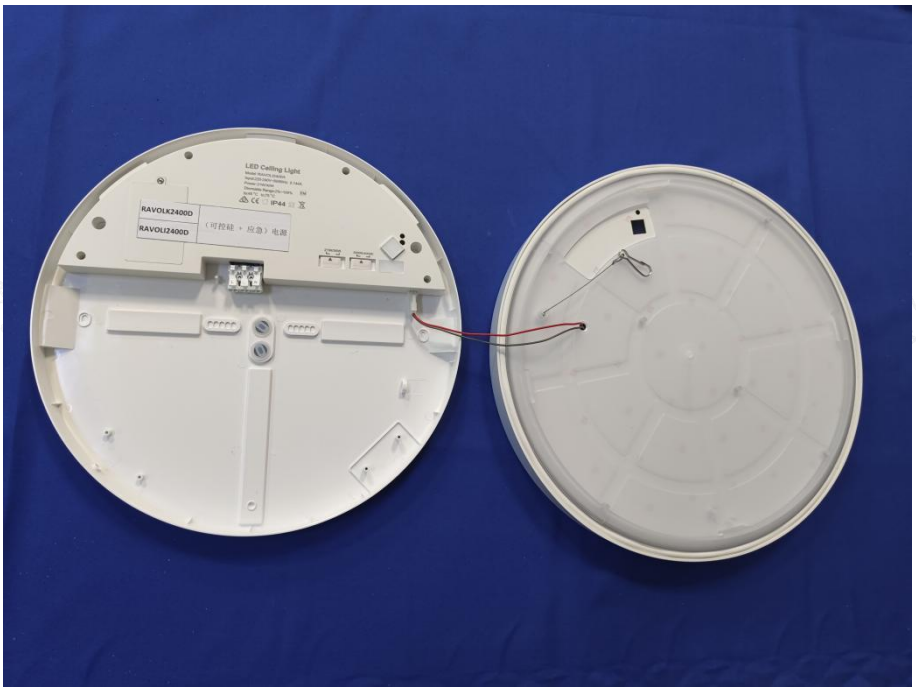
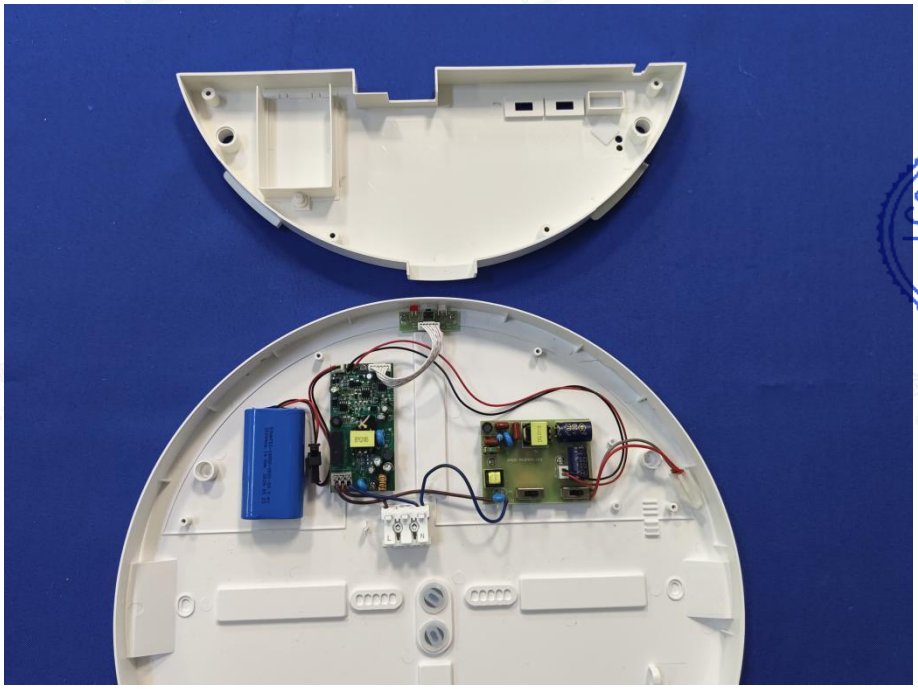


Photo 8: Test result of IP4X and IPX4 test



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