Environmental and material tests (ENV) SECTOR

Product description:	Led lamp
Tested Models:	Led Platax Plus -> code 555637.PLUS -> Sample 02 Led Luna Piena -> code 28920 -> Sample 03
Manufacturer:	**RELCO S.r.l.** Via delle Azalee, 6/4 - 20090 Buccinasco (MI) - Italy

Tested according to:	EN 60598-1:2015 + EC:2015 + EC:2016 + EC 2017 + A1:2018
Application:	Verification of degree of protection IP65
Remarks:	None

Customer:	**RELCO S.r.l.** Via delle Azalee, 6/4 - 20090 Buccinasco (MI) - Italy		
Purchase Order:	1902352	**dated:**	2019-11-28
Order Confirmation:	CO 2019-0391-00	**dated:**	2019-11-28

Samples receiving date:	2019-12-04 / 2020-02-06			
Tests date:	**from:**	2019-12-16	**to:**	2020-02-14

Test Laboratory

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Written by	Verified by	Approved by
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This document does not include any attachments.

Rev.	Date	Description
00	2020-02-20	Formal issue

INDEX

1. PURPOSE

Purpose of this document is to contain results of the tests, measurements and verifications performed to assess the compliance of the samples under test, as identified and described in paragraph 3, to requirements of the standards listed in paragraph 2.

2. APPLICABLE DOCUMENTS

In the following of this test report, the “applicable documents” will be indicated without date and/or edition number and/or amendments.

2.1 REFERENCE STANDARDS

The tests are performed in compliance with the standards listed below:

Document	Title
EN 60598-1:2015 + EC:2015 + EC:2016 + EC 2017 + A1:2018	Luminaires Part 1: General requirements and tests

2.2 TEST METHODS

The reference standards listed in the par. 2.1 require the use of the following basic standards that specify *how* the tests shall be performed. The dates of publication of the following basic standards are in conformity with the reference standards requirements.

In this case the reference standard contains the test method.

2.3 TEST PROCEDURES

Document	Title
INTEK 07 02 PP 041 PRE	Intek procedure for test IP first characteristic number
INTEK 07 02 PP 043 PRE	Intek procedure for test IP second characteristic number
INTEK 07 02 PP 038 PRE	Intek procedure for dielectric test

2.4 OTHER DOCUMENTS

None.

3. SAMPLE INFORMATION

Unless otherwise specified, the technical data stated in this paragraph are declared by the customer/manufacturer or obtained from the product technical documentation.

3.1 DESCRIPTION

Identification data of samples under test are reported in the first page of this document.

Photo of the sample (external view 1) – Sample 02

Photo of the sample (external view 2) – Sample 02

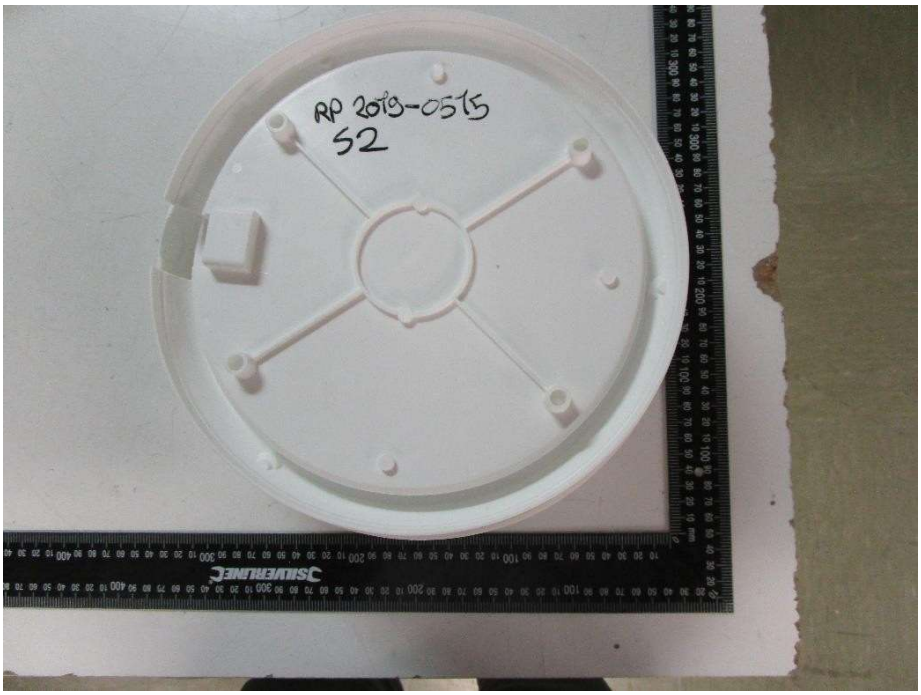


Photo of the sample (external view 3) – Sample 02

Marking plate / markings – Sample 02

Photo of the sample (external view 1) – Sample 03

Photo of the sample (external view 2) – Sample 03

Marking plate / markings – Sample 03

3.1.1 TECHNICAL DATA

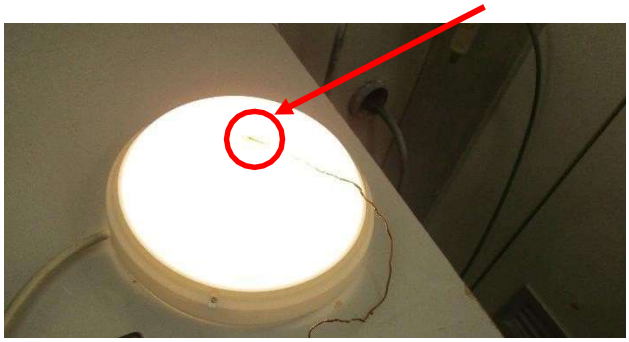
See marking plate in par 3.1

3.1.2 CLASSIFICATION

Degree of enclosure protection:	IP65

3.1.3 ADDITIONAL INFORMATION

- The measure of the stabilization temperature was made in the **front of the lamp**



- The cable glands mounted on the samples were supplied and assembled by the laboratory.
- Tightening torque: Sample 02 -> 0,4 Nm
  Sample 03 -> 1,8 Nm

3.2 SAMPLES ORIGIN

The test samples are supplied by:			
☐ **Manufacturer**	☒ **Customer**	☐ **Applicant**	☐ _____
The beginning sampling is carried out by:			
☐ **Manufacturer**	☐ **Customer**	☐ **Applicant**	☒ **Unknown**

Received samples:	01 for Led Platax Plus 555637.PLUS 01 for Led Luna Piena 28920	**Tested samples:**	01 for Led Platax Plus 555637.PLUS 01 for Led Luna Piena 28920
Selection method:	☐ **Random taking** ☒ **None** ☐ **On site by** _____		

4. TEST INFORMATION

4.1 CONDITIONS DURING THE TESTS

4.1.1 PERSONNEL

Tests performed by: ***Cristiano Bellanca (Intek S.p.A) for all the tests***

Test supervised by: ***Flavio Floriani (Intek S.p.A.) for all the tests***

4.1.2 ENVIRONMENTAL CONDITIONS

The laboratory environmental conditions are recorded during the tests and for each test, the ranges that the laboratory ensures are listed in the relative paragraph. These ranges are in conformity to the limits prescribed by the reference standards.
The measurement uncertainties are given with expanded uncertainty with a level of confidence of 95% (k=2)

4.1.3 CONVENTIONS

If applicable, on the right of each chapter or paragraph is written the number of the chapter or paragraph of reference Standard in the form: § number.

Throughout this report a **comma** is used as the decimal separator.

4.1.4 ABBREVIATIONS

N/A = Not Applicable
N/Av = Not Available
N/D = Not Declared
N/R = Not Required (by the applicant, customer or manufacturer)
No. = Number
F = Fail
P = Pass
TR = Test Report
EUT = Equipment Under Test
NCR = No Calibration Required
x … y = from x to y

4.2 CONFIGURATION MODES

During the tests the sample was configured following the methods and the procedures specified in the reference documents.

On customer request the test samples were mounted in vertical position.

4.2.1 AUXILIARY EQUIPMENT DESCRIPTION

Supporting equipment used during testing: none.

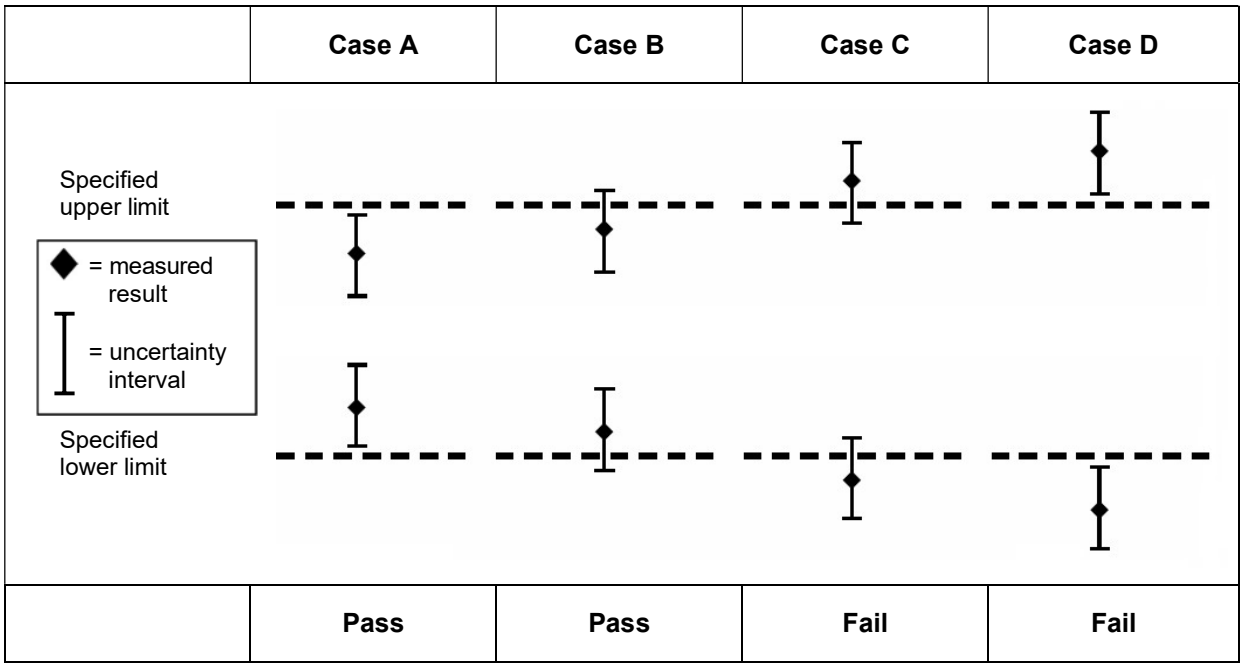
4.3 CRITERIA ADOPTED FOR COMPLIANCE EVALUATION

If applicable for compliance evaluation of the test results and considering the uncertainty values of the tests, the Laboratory adopts the following criteria:

- the reference standard specifies uncertainty for measurements:
  - measurements uncertainty permitted, or
  - instruments accuracy, or
  - application of measurements uncertainty to the measured values,

  in this case the measurement complies with the requirement if the measured value is within the limits, or with the correction due to the Laboratory uncertainty.

- the reference standard doesn't specify uncertainty for measurements or particular requirements of the instrumentation: in this case the Laboratory uses the following scheme:



For Case B the result is considered to comply with the requirements only if the measured result (♦) is within the limits of the standard.

5. TEST RESULTS

Par. TR	Requirement / Test	Reference	Result (+)
6.1	Verification of degree of protection IPX5	EN 60598-1 Par. 9.2.6	***PASS***
6.2	Verification of degree of protection IP6X	EN 60598-1 Par. 9.2.2	***PASS***

Notes:
(+) The criteria by which the results are expressed are given in the standards and/or in the Customer specification listed in paragraph 2 of this test report.

5.1 SAMPLES CORRELATION / TEST SEQUENCE

The samples are sequentially subjected to the tests described in the following table.

Seq.	Test	Date	Sample No.	Remarks
1	Verification of degree of protection IPX5	2019-12-17	02, 03	
2	Verification of degree of protection IP6X	2019-12-18	02, 03	

5.2 TEST METHOD DEVIATIONS

Test methods described in the reference document are adopted without any deviation.

5.3 OPINIONS AND INTERPRETATIONS

None.

6. TESTS PERFORMED

6.1 VERIFICATION OF DEGREE OF PROTECTION IPX5

The test is performed according to requirements of standards listed on chapter 2.	
Test method:	EN 60598-1 Par. 9.2.6 + 10.2
Test procedure:	INTEK 07 02 PP 043 PRE INTEK 07 02 PP 038 PRE

6.1.1 TEST PARAMETERS

Sample No.	02	03
Supply voltage	230 Vac	230 Vac
Stabilization temperature	41,6 °C	41,9 °C
Delivery rate	12,5 l/min	12,5 l/min
Test duration	15 min	15 min
Distance from nozzle to the sample	3000 mm	3000 mm

Acceptance criteria:
After completion of the tests:

- *no flashover or breakdown shall occur during the electric strength test;*
- *no trace of water on electrical connections, current carrying parts or on insulation where it could become a hazard for the user or surroundings*
- no trace of water on any part of a lamp requiring protection from splashing water

Dielectric test:

Sample No.	Applied voltage Value [Vac]	Test duration [s]	Application point
02	2960	60	live part vs external part covered with a metal foil
03	1460	60	live part vs. grounding and plastic parts covered with a metal foil

6.1.2 ENVIRONMENTAL CONDITIONS OF THE TEST SITE

Temperature:	(23,0 ± 5) °C
Relative humidity:	(50 ± 25) %
Atmospheric press.:	(960 ± 100) mbar

6.1.3 SUMMARY OF RESULTS

Sample No.	Description	Result
02	Verification of degree of protection IPX5	At the end of the test no traces of water were visible inside the enclosure. No flashover or breakdown occur during the dielectric strength test.
03	Verification of degree of protection IPX5	At the end of the test no traces of water were visible inside the enclosure. No flashover or breakdown occur during the dielectric strength test.

Notes: /

6.1.4 TEST INSTRUMENTATION

Description	Manufacturer	Model	Intek ID	Last Calibration	Calibration due
Water jet hose nozzle	ATS di Galbusera	03.22	0024 P	2018-05	2020-05
Water flowmeter 16,5 l/min	CVC	D4	0026 P	2019-05	2020-11
Measuring tape	BMI Radius	20 m	0695 P	2018-01	2022-01
Chronometer	RS	278698	0853 P	2019-03	2020-03
Thermometer	Delta Ohm + Elsi	HD 32.8	1325 P+ 1144 U	2019-12	2020-12
Thermometer	Fluke	52	0326 I	2019-04	2020-04
AC Dielectric strength tester	ETL Pruftechnik	UX36TPT5AC-200	0899 P	2019-02	2020-02
Thermo/hygrometer	Deltaohm	HD35EDL1NT VI	1047 P	2019-05	2020-05
Barometer	Fischer	/	0224 P	2019-01	2023-01

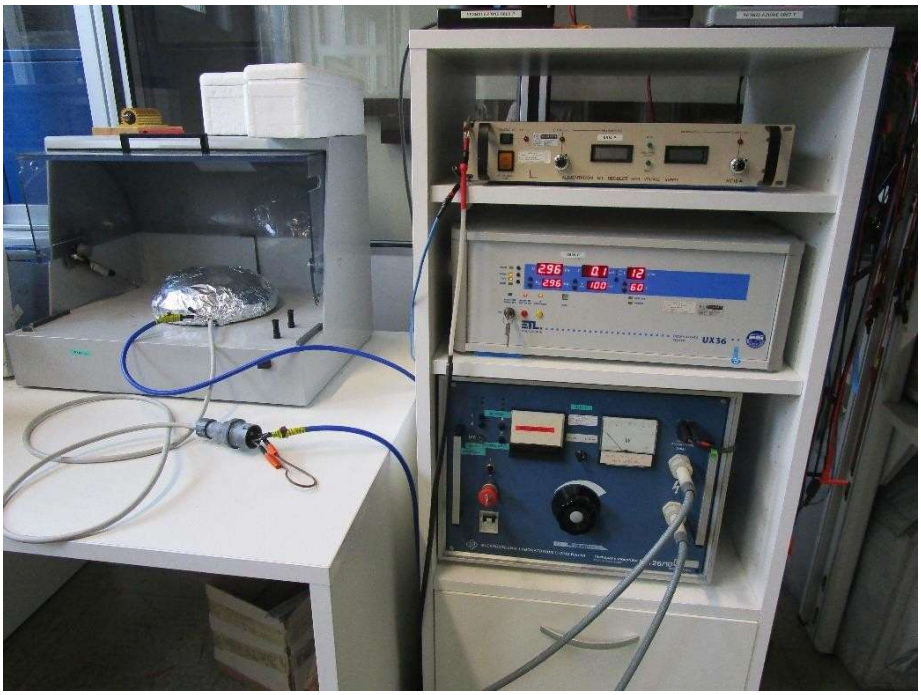
6.1.5 MEASUREMENT UNCERTAINTY

Values of expanded uncertainty are given with a level of confidence of 95 % (k = 2):

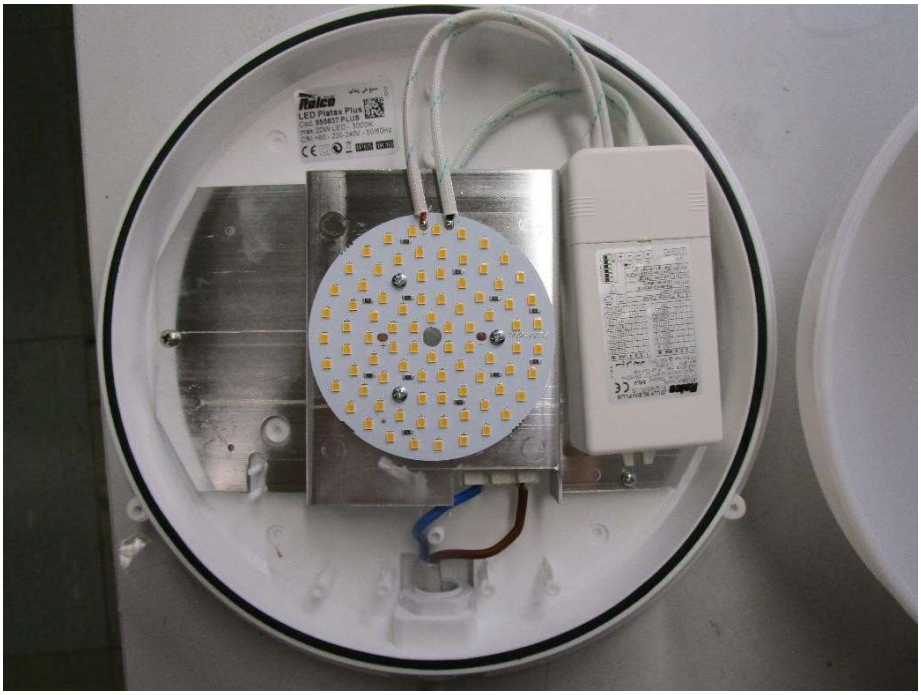
Measure	Uncertainty U
IPX5 test	
Water flow	5,0 %
Linear dimension > 25 mm	0,5 %
Temperature	2,0 °C
Time	1,0 %
Dielectric test	
Voltage (RMS) 500V to 5kV	3,0 %
Time	1,0 %
Leakage Current max 200 mA	1,5 %

6.1.6 GRAPHS AND PHOTOGRAPHS

1 - Photo of test set-up – Sample 02



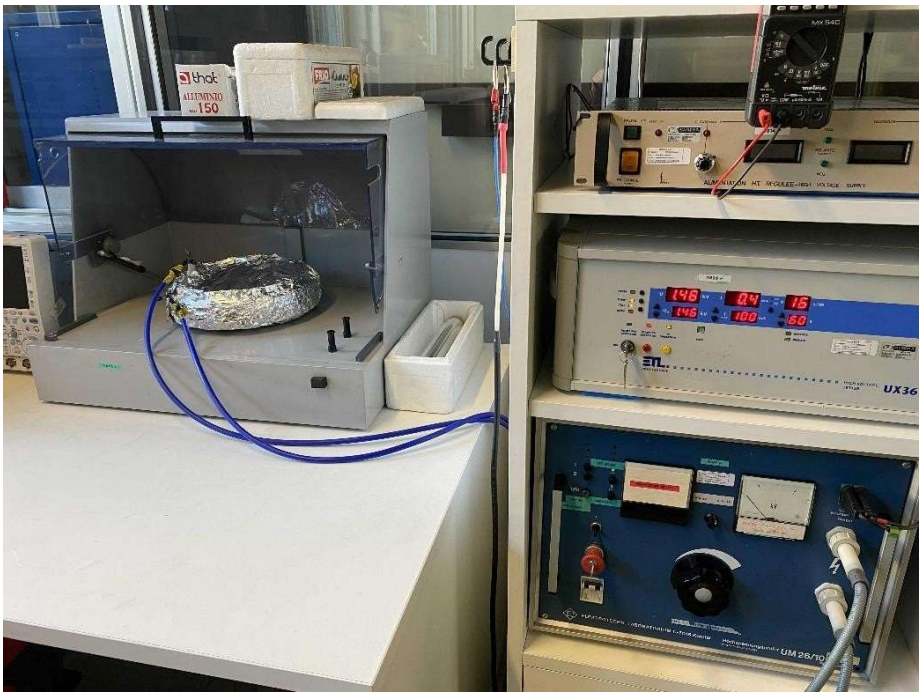
2 - Photo of test set-up – Sample 02



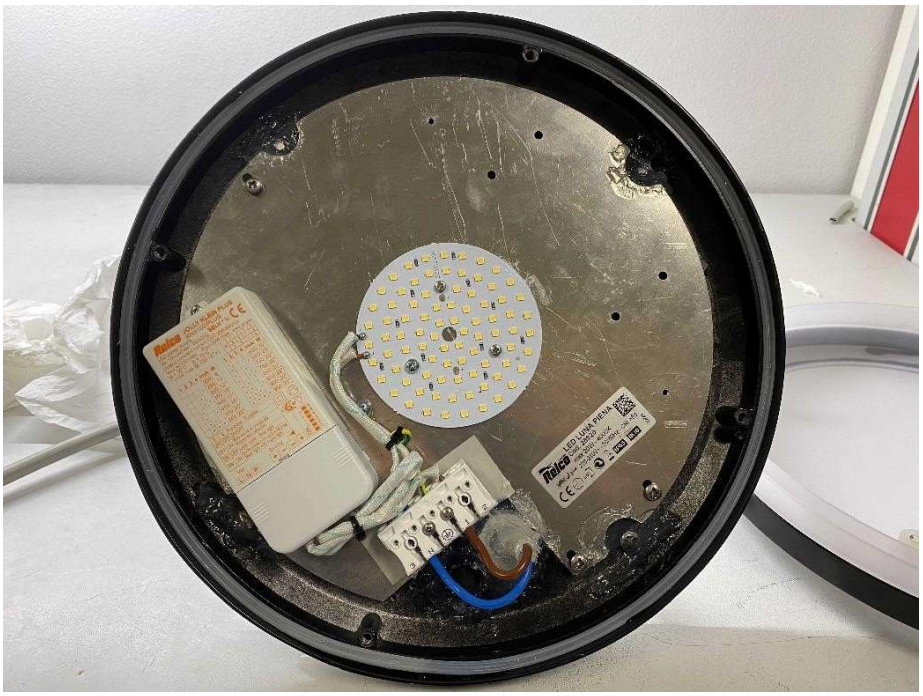
3 - Photo of test result – Sample 02

4 - Photo of test result – Sample 02

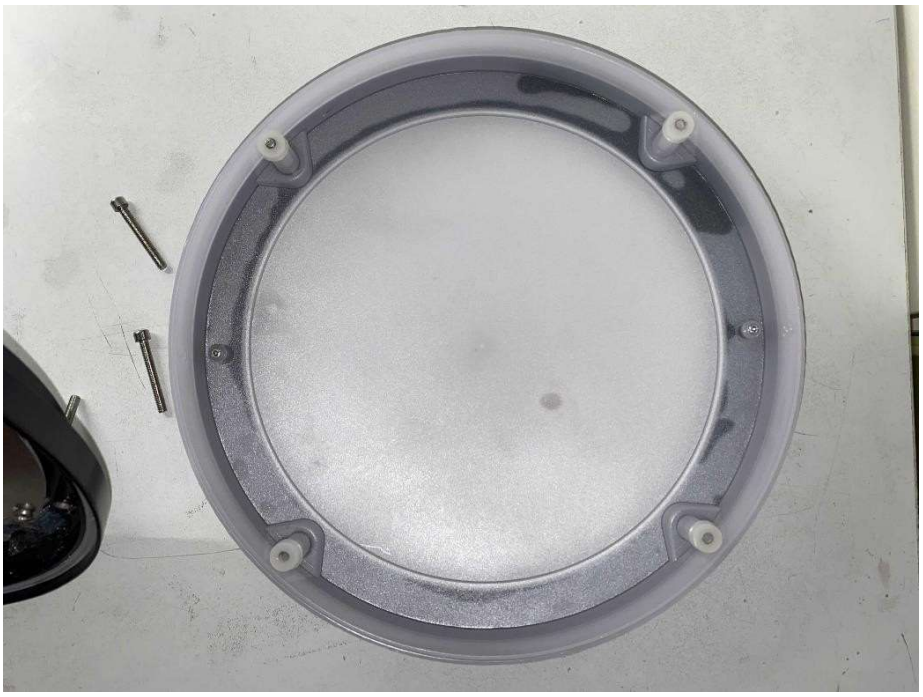
5 - Photo of test set-up – Sample 03



6 - Photo of test set-up – Sample 03



7 - Photo of test result – Sample 03



8 - Photo of test result – Sample 03

6.2 VERIFICATION OF DEGREE OF PROTECTION IP6X

The test is performed according to requirements of standards listed on chapter 2.	
Test method:	EN 60529 Par. 13.4 - 13.6
Test procedure:	INTEK 07 02 PP 041 PRE

6.2.1 TEST PARAMETERS

Sample No.	02	03
Supply voltage	230 Vac	230 Vac
Stabilization temperature	42,0 °C	41,9 °C
Time in which the sample remains switched on inside the dust chamber	1 min	1 min
Test duration	3 h	3 h

Acceptance criteria:
No deposit of talcum powder inside enclosures for dust-tight luminaires.

6.2.2 ENVIRONMENTAL CONDITIONS OF THE TEST SITE

Temperature:	(23,0 ± 5) °C
Relative humidity:	(50 ± 25) %
Atmospheric press.:	(960 ± 100) mbar

6.2.3 SUMMARY OF RESULTS

Sample No.	Description	Result
02	Verification of degree of protection IP6X	At the end of the test no traces of dust were visible inside the enclosure.
03	Verification of degree of protection IP6X	At the end of the test no traces of dust were visible inside the enclosure.

Notes: /

6.2.4 TEST INSTRUMENTATION

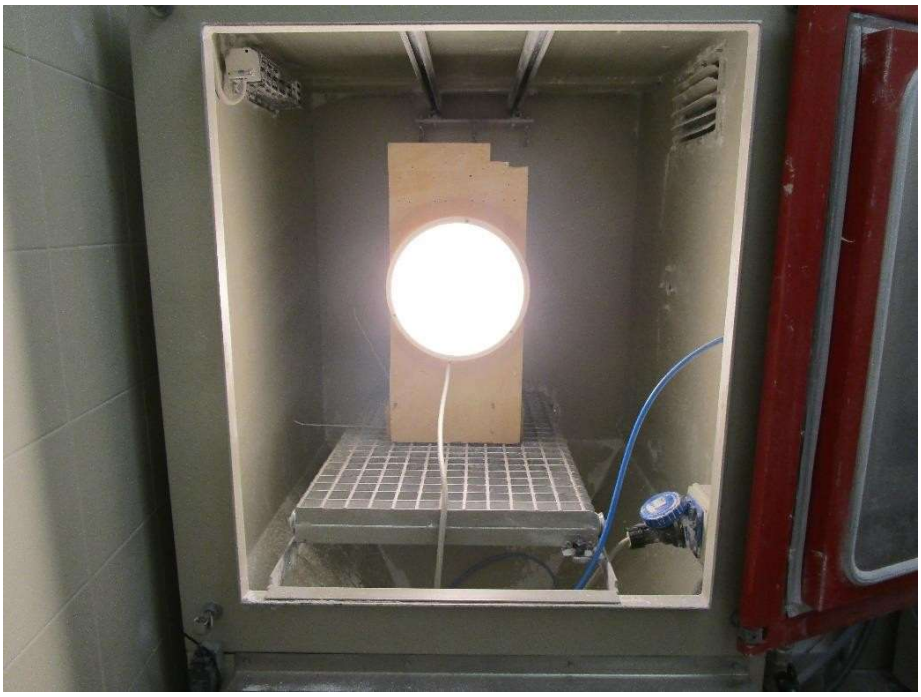
Description	Manufacturer	Model	Intek ID	Last Calibration	Calibration due
Dust chamber	ATS di Galbusera	03.01	0049 F	NCR	NCR
Talcum	/	/	0945 U	NCR	NCR
Test sieve for dust chamber	Endecotts	75 Mic.	0835 P	2019-11	2020-05
Chronometer	RS	278698	0853 P	2019-03	2020-03
Thermometer	Delta Ohm + Elsi	HD 32.8	1325 P+ 1144 U	2019-12	2020-12
Thermometer	Fluke	52	0326 I	2019-04	2020-04
Thermo/hygrometer	Deltaohm	HD35EDL1NT VI	1048 P	2019-05	2020-05
Barometer	Fischer	/	0224 P	2019-01	2023-01

6.2.5 MEASUREMENT UNCERTAINTY

Values of expanded uncertainty are given with a level of confidence of 95 % (k = 2):

Measure	Uncertainty U
Time	1,0 %
Temperature	2,0 °C

6.2.6 GRAPHS AND PHOTOGRAPHS

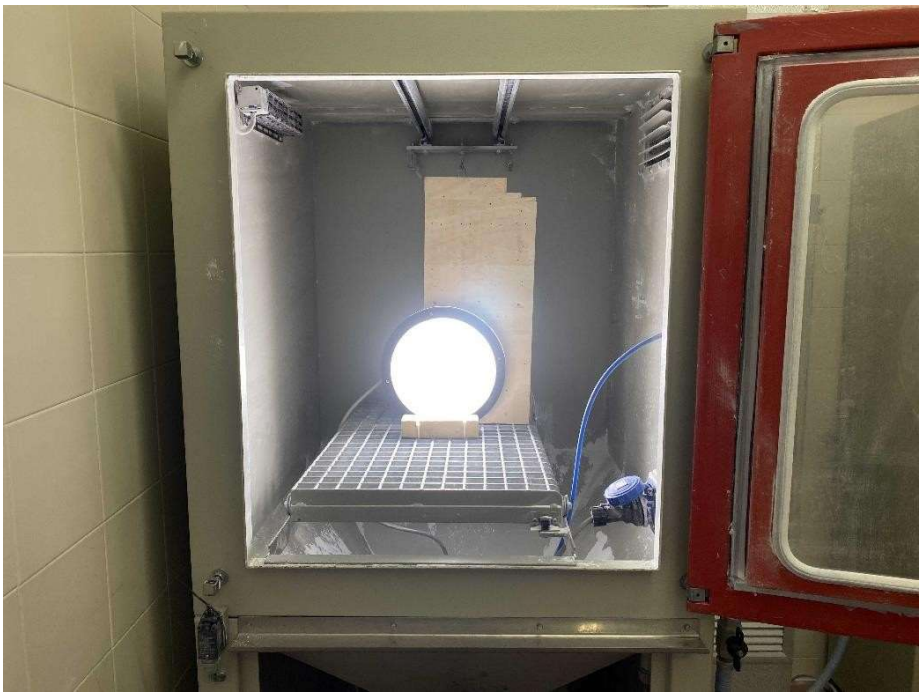


9 - Photo of test set-up – Sample 02

10 - Photo of test set-up – Sample 02

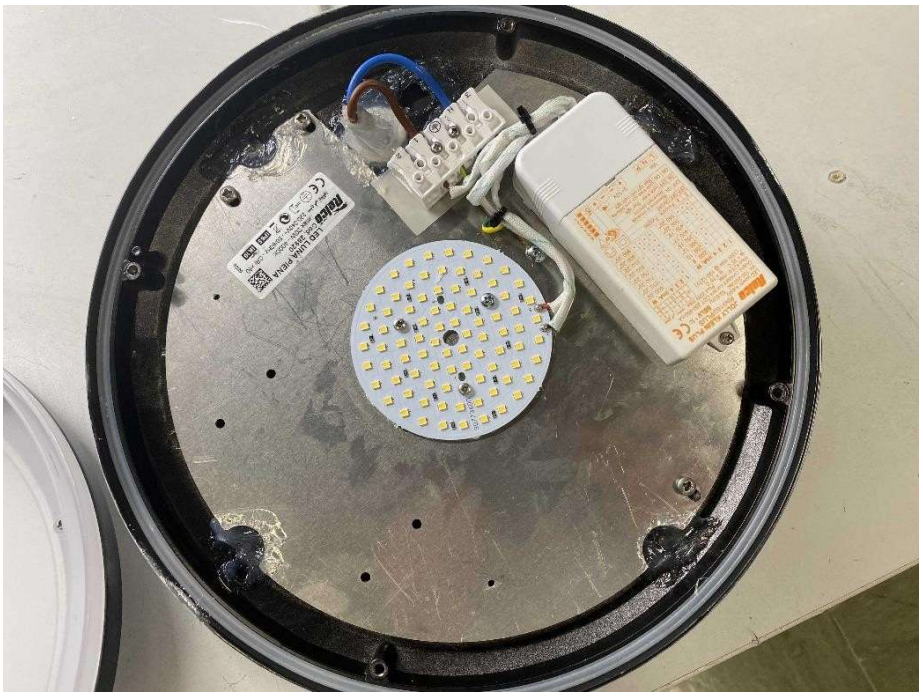
11 - Photo of test result – Sample 02

12 - Photo of test result – Sample 02



13 - Photo of test set-up – Sample 03

14 - Photo of test set-up – Sample 03



15 - Photo of test result – Sample 03

16 - Photo of test result – Sample 03

7. TEST INSTRUMENTATION

Common instruments not listed in the relative paragraph of the tests:

None.

7.1 INSTRUMENTATION ACCURACY

If reference standard doesn't specify otherwise, accuracy of used instruments is in accordance with the limits listed in the IEC operational document - IECEE OD-5014 ed. 1.0 "Instrument Accuracy Limit".

8. DOCUMENTATION

List of documentation supplied to the laboratory:

- Not available.

9. ANNEXES LIST

None.

End of test report.