

Centrum Badań i Certyfikacji
Zespół Laboratoriów Badawczych

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Katowice 2020-11-10

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ZESPÓŁ LABORATORIÓW
BADAWCZYCH

Świadczy usługi
w zakresie badań:

- kompatybilności elektromagnetycznej (EMC)
- środowiskowych
- elektrycznych
- mechanicznych
- trudnopalności materiałów
- funkcjonalności
- iskrobezpieczeństwa
- stopnia ochrony IP
- UN DOT 38.3

Dotyczy: Przekazania wyników pracy nr 6308/2020

W załączeniu przekazujemy wyniki pracy pt.:

Wykonanie badań IP68 zgodnie z ofertą nr FH/AB-501-340/20.
Opracowanie sprawozdania z tych badań.

wykonanej na Wasze zamówienie z dnia 12.10.2020 r.

- ♦ aparatury rozdzielczej
- ♦ stacji transformatorowych
- ♦ akumulatorów
- ♦ kabli i przewodów
- ♦ urządzeń gazometrycznych
- ♦ podzespołów stosowanych w kolejnictwie, branży automotive i siłach zbrojnych RP
- ♦ pozostałych urządzeń elektrycznych i elektronicznych

Z poważaniem

Sieć Badawcza Łukasiewicz
Instytut Techniki Innowacyjnych EMAG
Zastępca Dyrektora ds. Finansowych

mgr Maciej Czekał

Załączniki:

- TEST REPORT No. 6308-ZLK/2020 – 1 egz.

Kopia:

- CBC

LABORATORY OF CABLE TESTING AND ENVIRONMENTAL TESTS

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TEST REPORT No

6308-ZLK/2020

**IP68 tests:
Lamp type FT-161 LED**

Customer: Fristom Sp. z o.o. Sp. k.
ul. Przemysłowa 5
86-014 Sicienko

Order:

of 12 October, 2020

Test report prepared by:


Arkadiusz Szweda

Test report reviewed by:


Robert Ulfig


Test report authorized by:


Robert Ulfig

Deputy Head of Laboratory

Katowice, 30 October 2020


Report contains pages:	11	Version of the form PL-1/11-ZLK/1-en w.4	Copy No.	1
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1. Equipment under test (EUT):

Table 1. EUT data

No.	Name	Serial number/ Manufacturer mark	Date of delivery	Producer	Laboratory code
1	Lamp type FT-161 LED	-	09.10.2020	Fristom Sp. z o.o.	6308.01

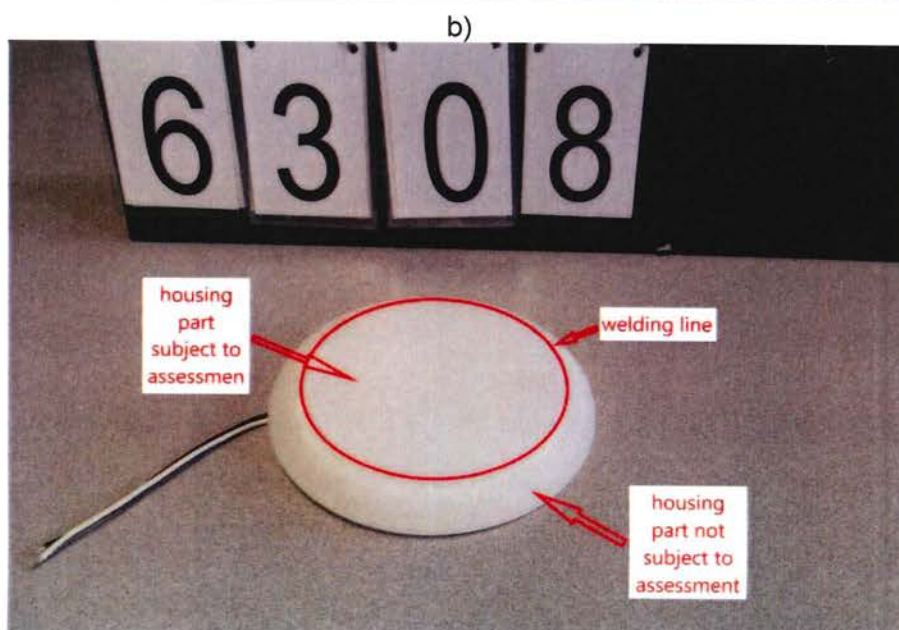
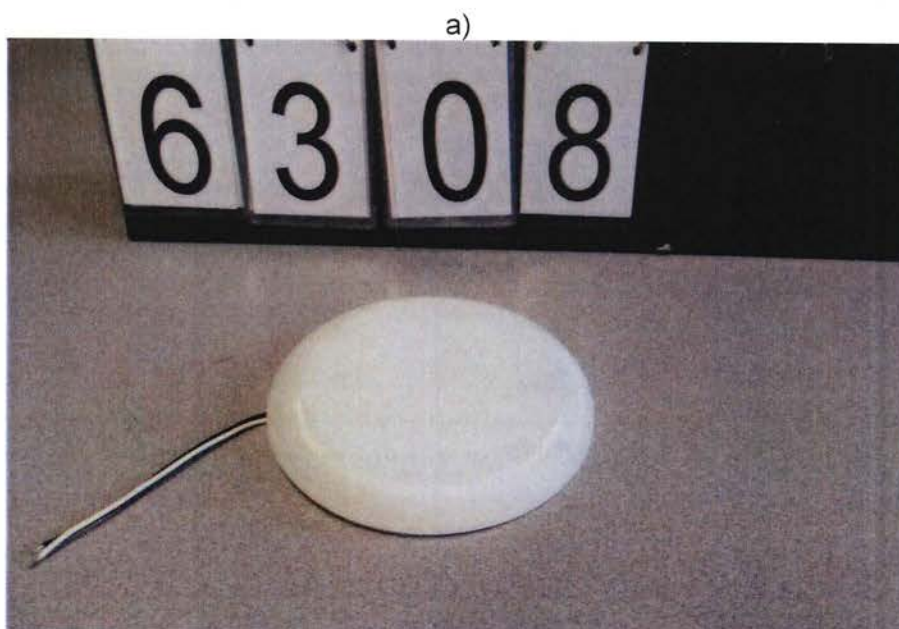



Photo. 1 EUT 6308.01: a) general view b) indication of the research area

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2. Test plan

Table 2. Scope of tests

No.	Tested feature / Test method	Remarks	A ¹⁾
1.	Test of protection against immersion in water according to PN-EN 60529:2003+A2:2014-07+AC:2017-12, IPx8.	Duration of immersion: 3h. Only the sealed part of the housing with the electronics is assessed. The part of the casing beyond the welding line is not subject to assessment (photo. 1b).	A
2.	Test of protection against dust with underpressure according to PN-EN 60529:2003+A2:2014-07+AC:2017-12, IP6x.	In order to generation underpressure in the lamp housing it will be drilled a hole with a diameter of 6 mm in the front of lamp. The part of the casing beyond the welding line is not subject to assessment.	A

"A" means the accredited testing;

"-" means the non-accredited testing;

2.1. Way of evaluation

Test of protection from dust :

- visual inspection of dust penetration into the housing,
- functional test.

Test of protection against immersion in water:

- visual inspection of water penetration into the housing (only outside the housing, without disassembling the object,
- functional test,
- insulation test before and after test of protection immersion in water.

2.2. Evaluation criteria

For IPx8 test according to PN-EN 60529:2003 + A2:2014-07 + AC:2017-12 p. 14.3.

For IP6x test according to PN-EN 60529:2003 + A2:2014-07 + AC:2017-12 p. 13.6.

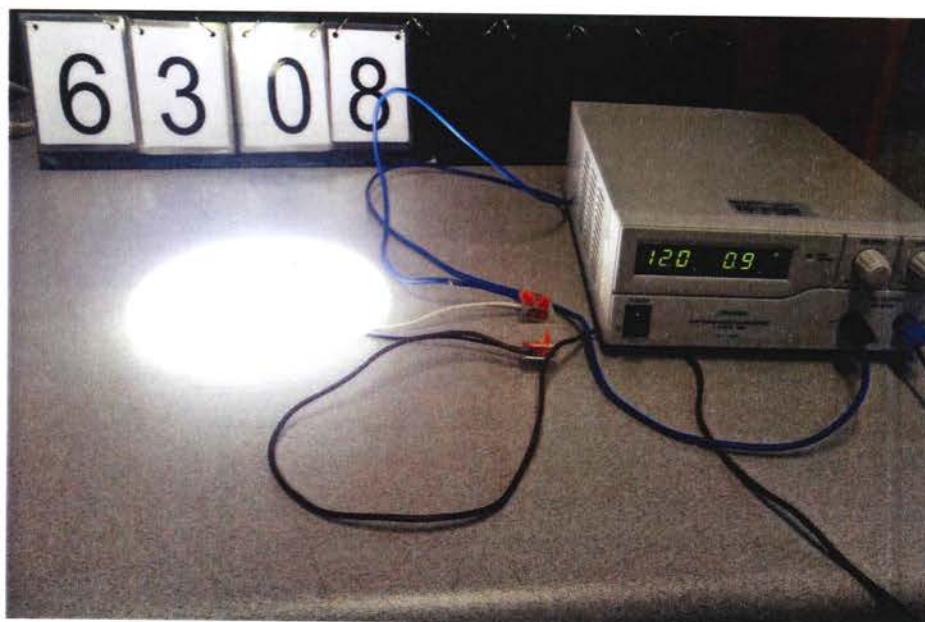


Photo. 2. Functional test before tests

3. Description and results of tests

3.1. Protection against immersion in water, IPx8 test.

3.1.1. Test procedure

Test was performed in accordance with recommendations of standard PN-EN 60529:2003+A2:2014-07+AC:2017-12, clause 14.2.8 – IPX8 test. The test was carried out in 28 October 2020.

Test parameters:

- Temperature of water: 19,2°C,
- Temperature of object: 20,4°C,
- Test duration: 3h.

Before the test, each sample specified in table 2 was mounted on the support (as shown in photography 3) and immersed in water for a time 3h (as shown in photography 4).



Photo. 3. EUT mounted on support



Photo. 4. EUT immersed in water

3.1.2. Test equipment

- | | |
|------------------------------------|------------|
| – Thermo-hygrometer LB-701H/LB-706 | ZL/0454/A, |
| – Thermometer LB-701T/LB-706 | ZL/1156/A, |
| – Stopwatch JS-6618 | ZL/1102/A, |
| – Thermo-hygro-barometer LB-717TWP | ZL/1514/A |
| – Ruler 1 m | ZL/0223/A, |

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- | | |
|--|-----------|
| – Water tank | ZL/1068/P |
| – Insulation resistance meter MIC-2500 | ZL/0828/A |
| – Insulation tester GPT-9903 | ZL/1151/A |
| – Power Supply HCS 3602 | ZL/1443/P |

3.1.3. Test results

After test the object was inspected: functional test (photo 5), visual inspection - without opening of the object housing (photo 6), insulation test. In the study of insulation, its resistance value and strength were tested between two wires power lamp and housing of the lamp. The research was done before and after test of protection from immersion in water. The test results are presented in Table 3 and 4.

During the examination, water was found in the outer flange of the housing outside the proper area containing the electronics, which is acceptable, in accordance with the customer's recommendations (Table 2). The remaining checks (functional and insulation test) ended positively.

Summary: Test result positive. Acceptance criteria are met.

Table 3. Test insulation before IP X8

No.	Measuring circuit	Insulation resistance measurement result (test voltage 500 V DC)		Voltage withstand test (500 V 50 Hz)
		Before voltage withstand test	After voltage withstand test	
1	housing of the lamp – two wires power lamp	>1TΩ	>1TΩ	OK

Table 4. Test insulation after IP X8


No.	Measuring circuit	Insulation resistance measurement result (test voltage 500 V DC)		Voltage withstand test (400 V 50 Hz)
		Before voltage withstand test	After voltage withstand test	
1	housing of the lamp – two wires power lamp	>1TΩ	413,2GΩ	OK



Photo. 5 Functional test of EUT 6308 after IPx8 test



Photo. 6. Inspection of EUT 6308.01 after IPx8 test

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3.2. Protection against penetration of dust: IP6x test.

3.2.1. Test procedure

Test was performed in accordance with recommendations of standard PN-EN 60529:2003+A2:2014-07+AC:2017-12, clause 13.4 - IP6x. The test was carried out in 29 October, 2020.

Test parameters:

- Type of dust: talcum powder,
- Rate of airflow: 0 l/min,
- Test duration 8 h.

Sample specified in table 2 was placed in the dust chamber and connected to a vacuum generating system, as shown in photograph 7 (marked with yellow circle).

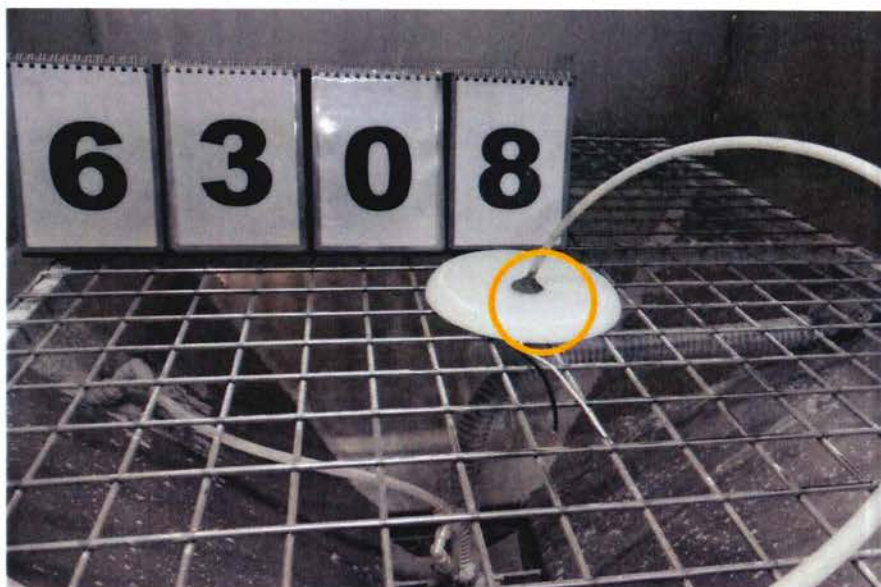


Photo. 7. EUT 6308.01 before IP6x test

3.2.2. Test equipment

- | | |
|------------------------------------|------------|
| – Dust chamber SD1000 S | ZL/1160/P, |
| – Thermo-hygro-barometer LB-717TWP | ZL/1514/A, |
| – Rotameter ROS-06 | ZL/0993/A, |
| – Thermo-hygrometer LB-701H/LB-706 | ZL/0454/A, |
| – Power Supply HCS 3602 | ZL/1443/P |

3.2.3. Test results

After the test, EUT was opened and inspected (photography 9).

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Dust did not penetrate into housing. No talcum powder was found on contacts. The object has passed a functional test (photo. 10).

Summary: Test result positive. Acceptance criteria are met.



Photo. 8. EUT 6308.01 after IP6x test

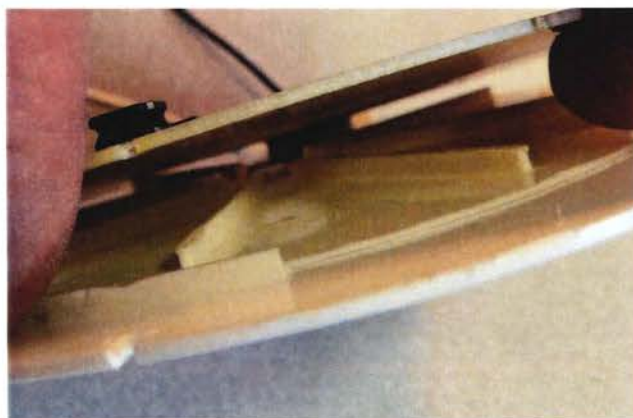
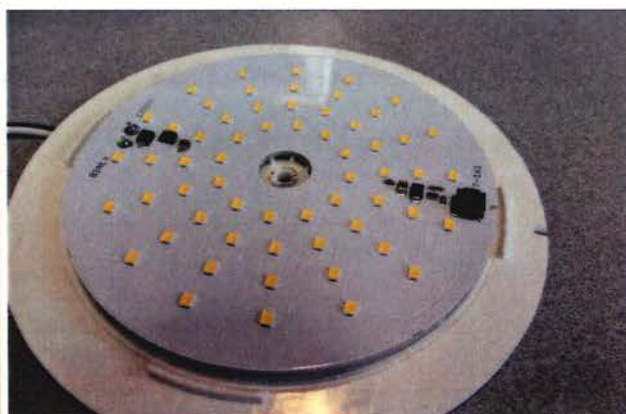
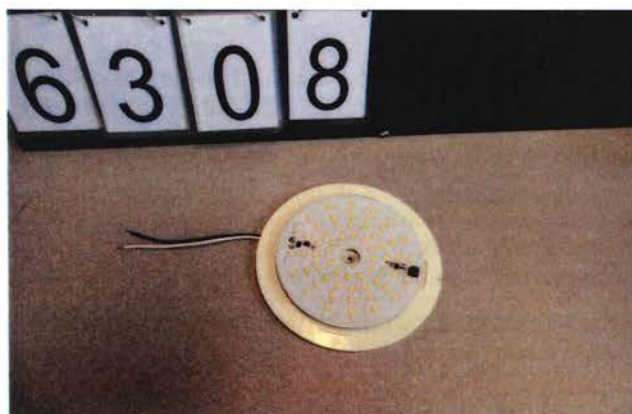



Photo. 9. Inspection of EUT 6308.01 after IP6x test

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Photo. 10. Functional test EUT 6308.01 after IP6x test

4. Tested by:

Arkadiusz Szveda in days 27-29 October 2020.

5. Distribution list of test reports:

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1	Fristom Sp. z o.o. Ul. Przemysłowa 5, 86-014 Sicienko
2	Sieć Badawcza Łukasiewicz – Instytut Techniki Innowacyjnych EMAG Laboratorium Badań Kabli i Badań Środowiskowych

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