



**OŚRODEK BADAŃ
ATESTACJI I CERTYFIKACJI**
OBAC Sp. z o.o.
ul. Łabędzka 21,
44-121 Gliwice
L A B O R E x
ul. Aronii 4
44-102 Gliwice

Gliwice, 19.03.2021

REPORT

from test No. LL/039/2021

Subject: Technical research of frangible connections v4

Test results are related to tested subject. Without written permission of LABOREx Laboratory this report cannot be disseminated differently but as whole document.

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1. Clients name and address:

Solutions4GA Sp. z o o
Gen. Sylwestra Kaliskiego 57 street
01-476 Warsaw

2. Contract/errand/order number:

0058/OBAC/0340I/CW/21

3. Case identification numer given by Laboratory:

LL/039/2021

4. Place of performing tests:

LABOREx Laboratory
4 Aronii street
44-102 Gliwice

5. Date of delivery of test samples:

12.03.2021

6. Description, status and identification of tested subject:

The client provided 6 frangible connection samples with complete airport lamps for research. Sample numbers given by the laboratory: LL/039/21/01 + .../06.

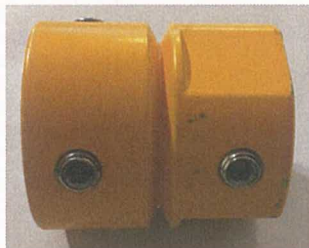


Photo 1. Frangible connection v4



Photo 2. airport lamp with frangible connection v4

Samples provided by the manufacturer.

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7. Date(s) of performing tests:

18.03.2021

8. Tests range and identification of method applied:

Lp.	Tested magnitude	Standards applied
1.	Static flangibility test of the connection	FAA AC 150-5345-46E point 3.4.2.1 FAA AC 150/5220-23 point 3.2 ICAO Doc 9157 AN901 Aerodrome Design Manual Part 6 Frangibility First Edition 2006 point 4.9 ICAO Annex 14 vol.I Edition 8, July 2018 point 5.3.1.3

9. Equipment used to perform tests:

Lp.	Equipment name	Identification number
1.	Hytherograph	A/207/LL
2.	Caliper	A/006/LL
3.	Testing machine EDZ-100	A/121/LL
4.	Stand for fragility tests	---

Apparatus was inspected prior to the tests – apparatus works correctly.

10. Test performance and results

The results and associated uncertainties relate only to the tested sample and may not relate to any part of product / substance / material.

Measurement uncertainty was determined according to the document EA-4/02. These uncertainties are expanded uncertainty at the 95% confidence level and coverage factor $k = 2$.

10.1. Static flangibility test of the connection

The tests were carried out at a temperature of $(20,1 \pm 2,0)$ °C and relative humidity of $(42,2 \pm 3,0)$ %.

The test was carried out in accordance with the requirements contained in the following documents:

- FAA AC 150-5345-46E point 3.4.2.1
- FAA AC 150/5220-23 point 3.2
- ICAO Doc 9157 AN901 Aerodrome Design Manual Part 6 Frangibility First Edition 2006 point 4.9
- ICAO Annex 14 vol.I Edition 8, July 2018 point 5.3.1.3.

In order to perform the test, the connections with lamps were individually mounted on the test stand and bent by force perpendicular to the connection until it was broken. The result of the test is the force registered when the connection breaks.

The connection was tested with complete airport lamp. The distance between the point of application of the bending force and the weakest point of the connection was 245 mm.

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Table 1. Test results

Sample No.	lamp install method	The force used to break the connection [N]	The moment used to break the connection [Nm]	Requirements according to FAA AC 150-5345-46E and Doc 9157 AN901 ICAO ADM Part 6 Frangibility
LL/039/20/01	1	2517	617	the connection breaking moment should be in the range of 203 Nm – 678 Nm
LL/039/20/02		2417	592	
LL/039/20/03		2661	651	
Average		2532	620	
LL/039/20/04	2	2030	497	
LL/039/20/05		2111	517	
		2335	572	
Average		2159	529	

Based on the tests, the moment required to break the connection (for both install method) is within the range specified in FAA AC 150-5345-46E and Doc 9157 AN901 ICAO ADM Part 6 Frangibility.

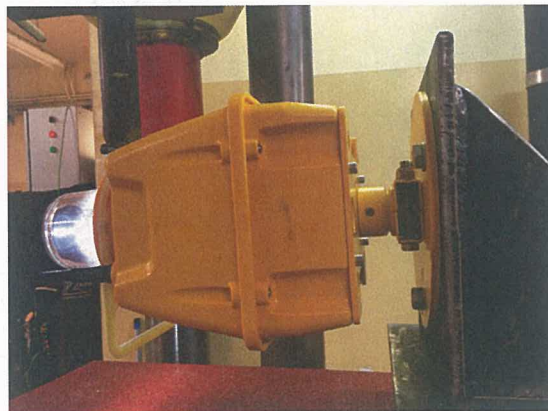


Photo 3. lamp install method 1

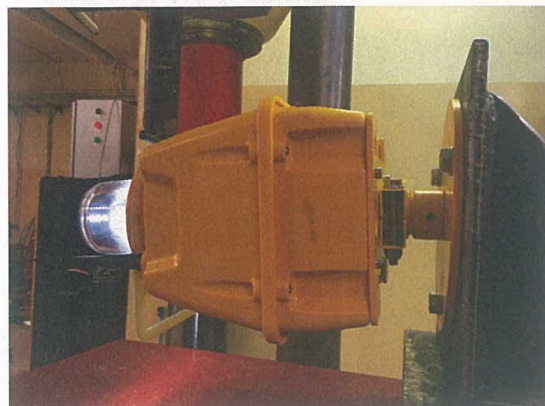


Photo 4. lamp install method 2

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Photo 5. Connection after tests

Tests performed by:

19.03.2021
Date

Sebastian Chojnowski
name and surname

Research Specialist
position


signature

Checked and verified by:

19.03.2021
Date

Wojciech Bobecki
name and surname

Laboratory Manager
position

**Kierownik Laboratorium
LABOREx**

signature
mgr inż. Wojciech Bobecki

END OF REPORT

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