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

Gliwice, 27.02.2020

REPORT

from test No. LL/075/2020

Subject: Technical research of frangible connections v2.1

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NIP: PL 631-21-53-136 z 24.04.2004 r.
REGON: 273725355
Kapitał zakładowy – 400 000,00 PLN
KRS: 0000161774 Sąd Rejonowy w Gliwicach
X Wydział Gospodarczy Krajowego Rejestru Sądowego

1. **Clients name and address:**

   Solutions4GA sp. z o.o.
   57 Gen. Sylwestra Kaliskiego street
   01-476 Warszawa

2. **Contract/errand/order number:**

   0114/OBAC/0351/CW/20

3. **Case identification numer given by Laboratory:**

   LL/075/2020

4. **Place of performing tests:**

   LABOREx Laboratory
   4 Aronii street
   44-102 Gliwice

5. **Date of delivery of test samples:**

   18.02.2020

6. **Description, status and identification of tested subject:**

   The client provided 5 frangible connection samples for research. Sample numbers given by the laboratory: LL/075/20/01 ÷ .../05.

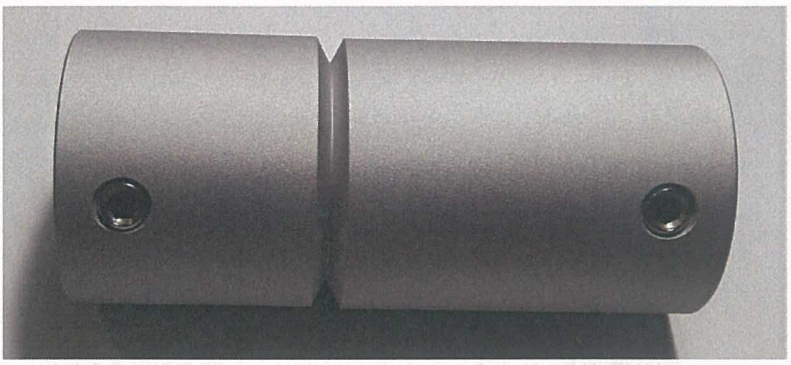
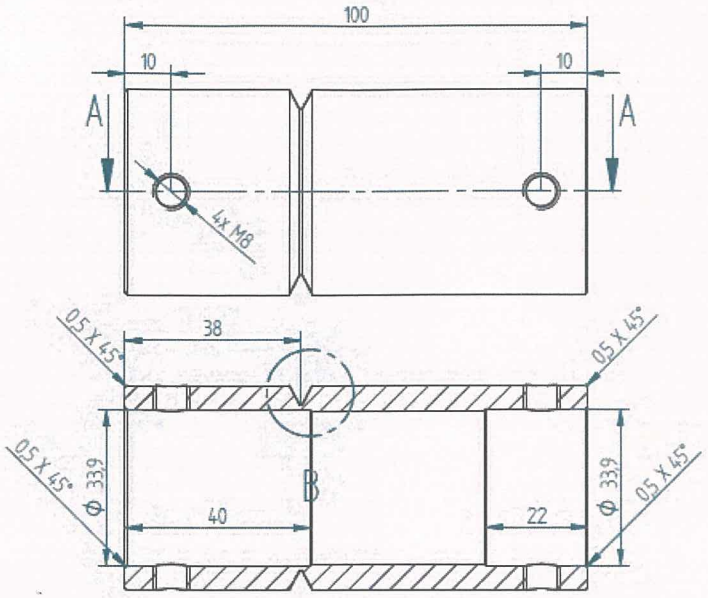
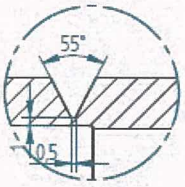


Photo 1. Frangible connection v2.1

Samples provided by the manufacturer.



CROSS SECTION A-A



DETAIL B

Pic. 1. Dimensions of frangible connections v2.1

7. Date(s) of performing tests:

27.02.2020

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 (21,5±2,0) °C and relative humidity of (46,4±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 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 itself (without the lamp). The distance between the point of application of the bending force and the weakest point of the connection was 50 mm.

Table 1. Test results

Sample No.	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/075/20/01	6127	306	the connection breaking moment should be in the range of **203 Nm – 678 Nm**
LL/075/20/02	6205	310	
LL/075/20/03	6172	308	
LL/075/20/04	5984	299	
LL/075/20/05	6098	304	
Average	**6117**	**306**	

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

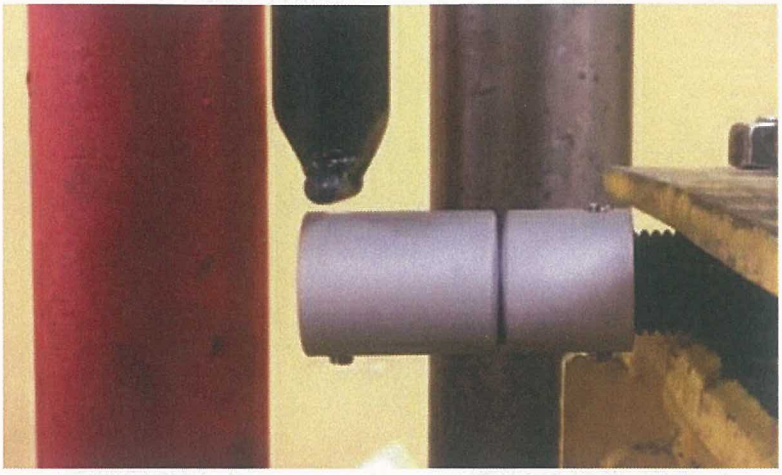


Photo 2. Stand for static bending tests of the connection

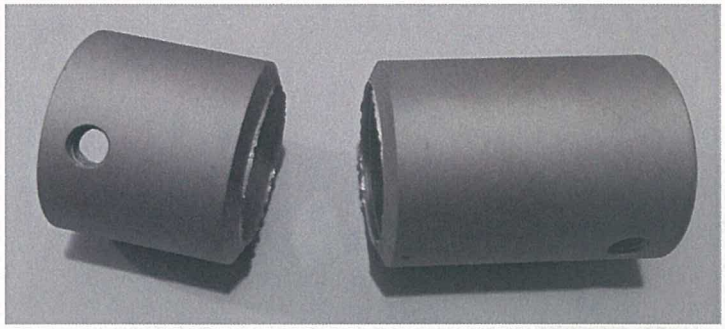


Photo 3. Connection LL/075/20/02 after tests

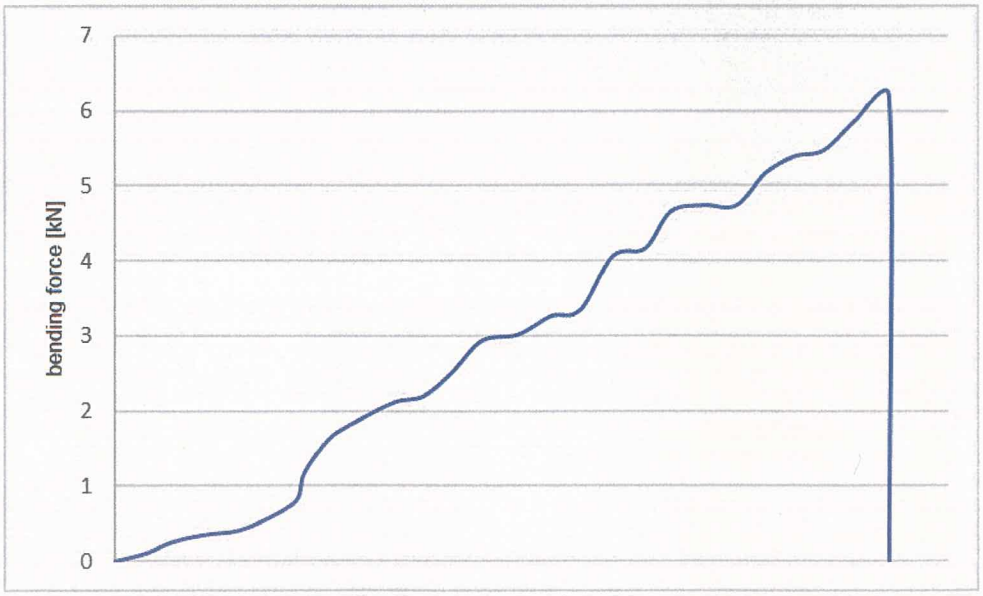


Diagram 1. Bending waveform of the connection LL/075/20/02

Tests performed by:

27.02.2020	Sebastian Chojnowski	Research Specjalist	.....
Date	name and surname	position	signature

Checked and veryfied by:

27.02.2020	Wojciech Bobecki	Laboratory Manager	mgr inż. Wojciech Bobecki
Date	name and surname	position	signature

Kierownik Laboratorium
LABOREx

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END OF REPORT