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DEPARTMENT OF BUILDING ELEMENTS ENGINEERING
BUILDING ELEMENTS LABORATORY

TEST REPORT No. LZE01-01716/18/Z00NZE

This report has been issued in three copies: two for the Client and one retained with the BRI.

The Test Report contains test results covered by the scope of accreditation as well as results of non-accredited tests. The latter are identified as being 'outside accreditation'.

Client: **CONECTO Sp. z o.o.**

Address: Florentyna 25
62-817 Żelazków

PRODUCT INFORMATION

Manufacturer (name and address):	CONECTO Sp. z o.o. Florentyna 25 62-817 Żelazków
Manufacturing Site – name and address:	**CONECTO Sp. z o.o. Beznatka 19, 62-834 Ceków Kolonia**
Product name	**CONECTO PARK** **waterproof expansion joint profiles for construction joints**
Product reference document	**Test for the purpose of a National Technical Assessment (KOT).**
Details of the product, its declared use and the applicable system of assessment and verification of the constancy of its performance	**CONECTO PARK waterproof expansion joint profiles for construction joints used to cover expansion gaps indoors and outdoors. AVCP System 4.**
Construction product type:	**SL.230.70.N** **GA.88.45.25S**

TEST INFORMATION

Test object: **designation, description, condition, identification**	CONECTO PARK waterproof expansion joint profiles for construction joints - SL.230.70.N - GA.88.45.25.S For a detailed description and drawings see Section 11 of this Test Report

Test Object receipt date: **16.07.2018**

Test Object receipt procedure: **PZZLB 18**

Test Object Receipt Record No.: **LZE01-01716/18/Z00NZE**

TEST INFORMATION

Commencement date: **17.07.2018**
Completion date: **21.09.2018**

1. Product and test data

1.1 Test object:

The object of tests were CONECTO PARK waterproof expansion joint profiles for construction joints made of EPDM – expansion element (insert), EN AW 6063-T6 aluminium alloy – brackets and chamfered strips, and 1.4301 stainless steel – chamfered strips, supplied for testing by CONECTO Sp. z o.o. The client provided the following for tests:

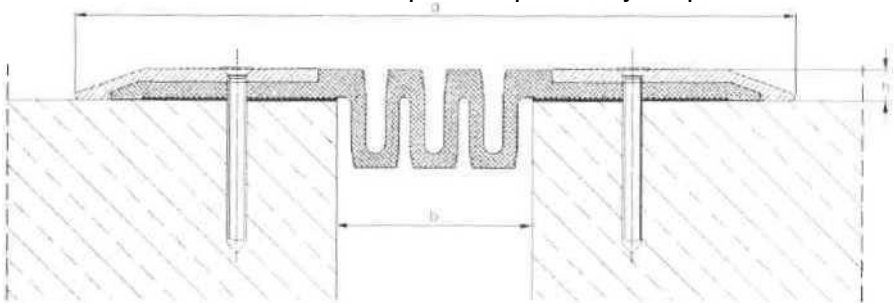
Product name	Number of samples supplied	Laboratory references
Waterproof expansion joint profile CONECTO PARK SL.230.70.N	3	LZE-01716-18-1-1+3
Waterproof expansion joint profile CONECTO PARK GA.88.45.25.S	3	LZE-01716-18-2-1+3

A CONECTO PARK SL 230.70 N waterproof expansion joint profile was fixed to a steel element to simulate an expansion gap for durability testing. The chamfered strips were fixed to the test element with countersunk screws to simulate steel anchors used for concrete installation. The expansion joint profile was installed with an expansion gap of 130 mm (85 + 45 mm).

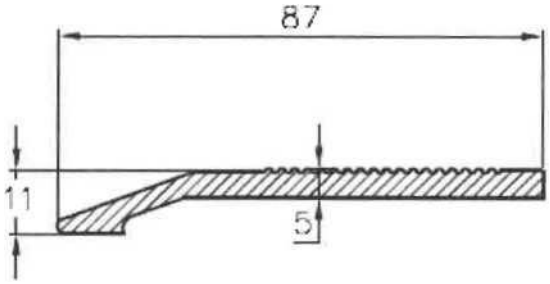
A CONECTO PARK GA 88.45.25.S waterproof expansion joint profile was fixed to a steel element to simulate an expansion gap for durability testing. The chamfered strips were fixed to brackets according to the Manufacturer's instructions. The brackets were fixed to the test element with countersunk screws to simulate steel anchors used for concrete installation. In order to achieve a level surface steel plates were fixed to the test element. The expansion joint profile was installed with an expansion gap of 155 mm (110 + 45 mm).

Note: The assessment concerned the waterproof expansion joint profiles. It did not apply to the mounting system.

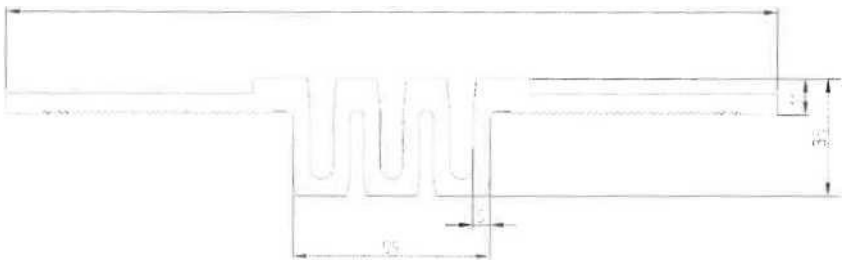
a) CONECTO PARK SL 230.70.N waterproof expansion joint profile – surface installation



Item	Model	Movement capacity [mm]	Dimensions [mm]		
			a	b	h
1	CONECTO SL 230.70.N	Horizontal ±45 Vertical ±30	257	85	11

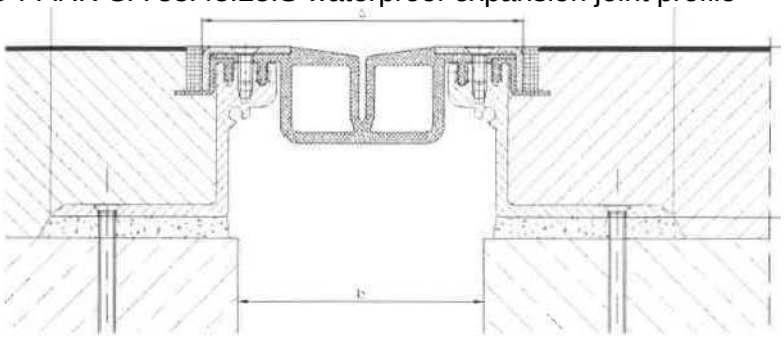


The chamfered strip of the SL.230.70.N profile – material: EN-AW 6063-T6

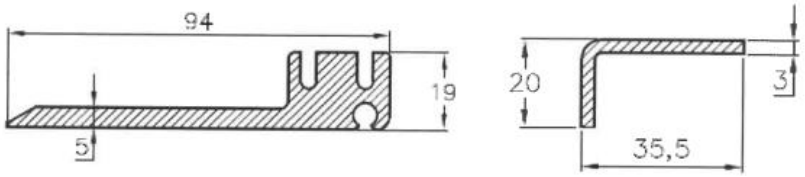


The EPDM expansion element of the SL.230.70.N profile

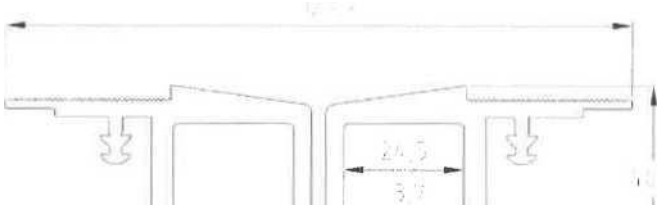
b) CONECTO PARK GA 88.45.25.S waterproof expansion joint profile



Item	Model	Movement capacity [mm]	Dimensions [mm]			
			a	b	c	h
1.	CONECTO GA 88.45.25	Horizontal ±45 Vertical ±30	124	110	257	25



The bracket (material: EN-AW 6063-T6) and the chamfered strip (material: 1.4301) of the GA 88.45.25.S profile



The EPDM expansion element of the GA.88.45.25.S

1.2 Applicable test documents:

1.2.1 Test procedures and methods:

- PB LOW-001/4/09-2007 – Geometric dimension measurements
- PN-EN 13018:2004 Non-Destructive Testing. Visual testing. General principles
- Own methods of durability testing (repeated wheel passage – 100,000 cycles; repeated profile expansion/compression within the declared movement capacity of the joint - 5,000 cycles)
- Own methods of durability testing in extreme temperatures (repeated wheel passage – 20,000 cycles; repeated profile expansion/compression within the declared movement capacity of the joint – 1,000 cycles)

2. Test results

2.1. Verification of the appearance, shape and dimensions

2.1.1. Test method – PB LOW-001/4/09-2007, PN-EN 13018:2004

2.1.2. Measurement equipment, instruments and means used: LOW-156 slide calliper, LOW-159 slide calliper, LOW-162 micrometer.

2.1.3. Obtained results:

a) Shape, dimensions and deviations

Table 1. Dimensions of CONECTO PARK waterproof expansion joint profiles

Sample Ref. No.	Specified dimensions [mm]	Tolerance (Class 3, PN-EN 22768-1:1999)	Measured values			
			1	2	3	Avg. value
LZE-01716-18-1-x Item 1.1.a)	87	±0.8	87.02	87.01	87.03	87.02
	5	±0.3	5.00	5.01	5.01	5.01
	h = 11	±0.5	10.98	10.98	10.98	10.98
	a = 257	±1.2	257.25	257.30	257.23	257.26
	b = 85	±0.8	84.95	84.97	84.91	84.94
LZE-01716-18-2-x Item 1.1.b)	94	±0.8	94.02	94.02	94.02	94.02
	19	±0.5	18.98	18.99	18.99	18.99
	5	±0.3	4.98	4.98	4.98	4.98
	20	±0.5	19.89	19.91	19.90	19.90
	35,5	±0.8	34.97	34.97	34.95	34.96
	3	±0.3	2.98	2.97	2.97	2.97
	c = 257	±1.2	257.19	257.26	257.13	257.19
	b = 110	±0.8	110.05	109.98	110.02	110.02

The expanded uncertainty of measurement due to the accuracy limits of the equipment used, determined with 95% confidence level, is 0.02 [mm] for k=2.

The shape of expansion joint profiles LZE-01716-18-1-1 and LZE-01716-18-2-1, and of their elements is consistent with the manufacturer's documentation.

b) Appearance and quality of workmanship

The LZE-01716-18-1-1 and LZE-01716-18-2-1 profiles show no visible damage (fractures, cracks, dents) or defects in their appearance. The temporary fastening elements are good-fit, smooth, free from gaps or differences in level. The sealing inserts adhere without folding or gaps to the corresponding surface of the profile.

2.2 Verification of the durability (in ambient temperatures) and watertightness of the expansion joint profiles – method outside accreditation

2.2.1 Test method: Own method, PN-EN 13018:2004

2.2.2 Measurement equipment, instruments and means used: LOW-046 force transducer, LOW-044 digital force meter, LOW-237 test rig for expansion joint durability testing, LOW-053 stopwatch, LOW-227 test rig.

2.2.3 Verification results:

A sample with an expansion joint was mounted in the durability test rig. Specific force was applied to the sample via a 200 mm-wide wheel and the pressure adjusted so that the required length of contact area with the sample surface was obtained. Then a pneumatic cylinder induced reciprocating movement of the sample with a stroke of 400 mm, so that the loaded wheel could roll on the expansion joint, the forward and the return movement of the sample making a single test cycle. The test parameters and the results are shown in Table 2.

Table 2. Durability test results

Sample Ref. No.	Test parameters			Test result
	Contact area with the surface [mm]	Applied force [kN]	Number of cycles run	
LZE-01716-18-1-1	200	20	100 000	no damage*
LZE-01716-18-2-1	200	20	100 000	no damage*

*No damage was observed and the samples were accepted for further testing (watertightness).
The expanded uncertainty of measurement of the applied force due to the accuracy limits of the equipment used, determined with 95% confidence level, is 1% for k=2.

After completion of the test cycles the sample was tested for watertightness. The surface of the sample was sprayed with water at a specific flow rate and for appropriate time. The test parameters and the results are shown in Table 3.

Table 3. Watertightness test results for profiles after the durability test.

Sample Ref. No.	Test parameters		Test result
	Water spray rate [l/min]	Spraying time [min]	
LZE-01716-18-1-1	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-1	10	10	Expansion joint revealed no leaks

Considering the nature of the test described above, the uncertainty of the presented results (no leaks) cannot be determined in the current state of knowledge.

2.3 Verification of the durability under repeated changes in the width of the expansion gap within the declared movement capacity values (in ambient temperatures) and of the watertightness of the expansion joint profiles - method outside accreditation.

2.3.1 Test method: Own method, PN-EN 13018:2004

2.3.2 Measurement equipment, instruments and means used: LOW-281 testing machine, LOW-053 stopwatch, LOW-227 test rig.

2.3.3 Verification results:

A properly prepared test sample was mounted on the testing machine and cyclic loads were applied to the sample making the expansion joint profile open/close according to its declared movement capacity values. The test parameters and the results are shown in Table 4.

Table 4. Expansion joint durability test results

Sample Ref. No.	Test parameters		Test result
	Sample movement range (max and min opening/closing) [mm]	Number of cycles run	
LZE-01716-18-1-1	85 ±45	5 000	no damage*
LZE-01716-18-2-1	110±45	5 000	no damage*

*No damage was observed and the samples were accepted for further testing (watertightness).

Considering the nature of the test described above, the uncertainty of the presented results (no damage) cannot be determined in the current state of knowledge.

After completion of the test cycles the sample was tested for watertightness. The surface of the sample was sprayed with water at a specific flow rate and for appropriate time. The test parameters and the results are shown in Table 5.

Table 5. Watertightness test results for profiles after the durability test.

Sample Ref. No.	Test parameters		Test result
	Water spray rate [l/min]	Spraying time [min]	
LZE-01716-18-1-1	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-1	10	10	Expansion joint revealed no leaks

Considering the nature of the test described above, the uncertainty of the presented results (no leaks) cannot be determined in the current state of knowledge.

2.4 Verification of durability (within manufacturer's declared extreme temperatures) and watertightness of the expansion joint profiles

2.4.1 Test method: Own method.

2.4.2 Measurement equipment, instruments and means used: LOW-046 force transducer, LOW-044 digital force meter, LOW-237 test rig for expansion joint durability testing, LOW-053 stopwatch, LOW-227 test rig, LOW-304 environmental chamber.

2.4.3 Verification results:

A test sample with an expansion joint profile was mounted on a test rig for durability testing and the whole set up was placed in an environmental chamber with the temperature set according to the manufacturer's declared operating extreme temperature range for the product.

Specific force was applied to the sample via a 200 mm-wide wheel and the pressure adjusted so that the required length of contact area with the sample surface was obtained. Then a pneumatic cylinder induced reciprocating movement of the sample with a stroke of 400 mm, so that the loaded wheel could roll on the expansion joint, the forward and the return movement of the sample making a single test cycle. The test parameters and the results are shown in Table 6.

Table 6. Durability test results

Sample Ref. No.	Test parameters				Test result
	Test temperature [°C]	Contact area with the surface [mm]	Applied force [kN]	Number of cycles run	
LZE-01716-18-1-2	-30	200	20	20 000	no damage*
LZE-01716-18-2-2	-30	200	20	20 000	no damage*
LZE-01716-18-1-3	+80	200	20	20 000	no damage*
LZE-01716-18-2-3	+80	200	20	20 000	no damage*

*No damage was observed and the samples were accepted for further testing (watertightness).
Considering the nature of the test described above, the uncertainty of the presented results (no damage) cannot be determined in the current state of knowledge. The expanded uncertainty of measurement of the applied force, affecting the final result, due to the accuracy limits of the equipment used, determined with 95% confidence level, is 1% for k=2.

After completion of the test cycles the sample was tested for watertightness. The surface of the sample was sprayed with water at a specific flow rate and for appropriate time. The test parameters and the results are shown in Table 7.

Table 7. Watertightness test results for profiles after the durability test.

Sample Ref. No.	Test parameters		Test result
	Water spray rate [l/min]	Spraying time [min]	
LZE-01716-18-1-2	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-2	10	10	Expansion joint revealed no leaks
LZE-01716-18-1-3	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-3	10	10	Expansion joint revealed no leaks

Considering the nature of the test described above, the uncertainty of the presented results (no leaks) cannot be determined in the current state of knowledge.

2.5 Verification of the durability under repeated changes in the width of the expansion gap within the declared movement capacity values (in declared extreme temperatures) and of the watertightness of the expansion joint profiles

2.5.1 Test method: Own method.

2.5.2 Measurement equipment, instruments and means used: Test rig, LOW-053 stopwatch, LOW-304 environmental chamber.

2.5.3 Verification results:

A properly prepared test sample was mounted on the test rig and placed in the environmental chamber. The temperature was set according to the manufacturer's declared operating extreme temperature range for the product, and then the product was subject to cyclic loads making the expansion joint profile open/close according to its declared movement capacity values. The test parameters and the results are shown in Table 8.

Table 8. Expansion joint durability test results

Sample Ref. No.	Test parameters			Test result
	Test temperature [°C]	Sample movement range (max and min opening/closing) [mm]	Number of cycles run	
LZE-01716-18-1-2	-30	85 ± 45	1 000	no damage*
LZE-01716-18-2-2	-30	110 ± 45	1 000	no damage*
LZE-01716-18-1-3	+80	85 ± 45	1 000	no damage*
LZE-01716-18-2-3	+80	110 ± 45	1 000	no damage*

*No damage was observed and the samples were accepted for further testing (watertightness).

Considering the nature of the test described above, the uncertainty of the presented results (no damage) cannot be determined in the current state of knowledge.

After completion of the test cycles the sample was tested for watertightness. The surface of the sample was sprayed with water at a specific flow rate and for appropriate time. The test parameters and the results are shown in Table 9.

Table 9. Watertightness test results for profiles after the durability test.

Sample Ref. No.	Test parameters		Test result
	Water spray rate [l/min]	Spraying time [min]	
LZE-01716-18-1-2	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-2	10	10	Expansion joint revealed no leaks
LZE-01716-18-1-3	10	10	Expansion joint revealed no leaks
LZE-01716-18-2-3	10	10	Expansion joint revealed no leaks

Considering the nature of the test described above, the uncertainty of the presented results (no leaks) cannot be determined in the current state of knowledge.

Person responsible for the test
Maciej Murkowski, MSc Eng.

signature

Report authorised by:
Wojciech Kujawski, MSc Eng.

signature

Poznań, date: 04 October 2018

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LZE Laboratory Manager
Marzena Jakimowicz, MSc Eng

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