TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
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L 1018.3

Testing Laboratory No. 1018.3 accredited by ČIA pursuant to ČSN EN ISO/IEC 17025:2018

TEST REPORT

No. 070-065275

on test of fibre-cement profiled sheets

Manufacturer:	LTD IVANO-FRANKIVSK-DAH
Address:	77422, Ivano-Frankivsk region, Tysmenytsia district, v. Yamnytsia N. Yaremchuk st., apt. 2/1 Ukraine
Identification No.:	43632293
Plant:	LTD IVANO-FRANKIVSK-DAH
Address:	77422, Ivano-Frankivsk region, Tysmenytsia district, v. Yamnytsia N. Yaremchuk st., apt. 2/1, Ukraine
Test sample:	VZ070240230
Order No.:	Z070240153

Number of pages of the test report incl. title page: 6 Pages of annexes: 0

Prepared by:

Bohdan Sousedík
test technician - specialist

Approved by:

Bohdana Zámečníková
head of the Testing Department

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stamp of the testing laboratory No. 1018.3

Copy No.:

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Ostrava
on 08/10/2024

Declaration

1) The test results in this Report relate only to the tested article and they do not substitute any other documents.
2) The test report must be copied as a whole only otherwise a written consent of the testing laboratory is needed.

1 Sample data

Evidence Number:	VZ070240230
Sample:	Fibre-cement profiled sheets (painted or unpainted) NT C 625 x 1166 x 6.2 (& so on), for roofing, internal wall finishes, external wall and ceiling finishes according to EN 494:2012+A1:2015*
Contract:	Z070200218
Date of sampling:	06/2024*
Sampling place:	Ready product stock*

*) Information provided by the manufacturer.

Data on sampling conditions, plan and procedure of sampling and name of the person who performed sampling are stated in the Sampling Minutes that are stored in the Testing Department

The test results relate to the delivered test sample.

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2 Test methods

Identification of the test method:		Title of the test method
ČSN EN 494+A1, p. 7.2	Fibre-cement profiled sheets and fittings – Product specification and test methods	Determination of dimensions
ČSN EN 494+A1, p. 7.3	Fibre-cement profiled sheets and fittings – Product specification and test methods	Determination of density, bending changes – hot water test and absorption – drying test
ČSN EN 494+A1, p. 7.4	Fibre-cement profiled sheets and fittings – Product specification and test methods	Determination of frost resistance, heat – rain test

Additions, deviations or exclusions from the standard procedure or use of non-standardized methods: were not applied.

3 Test results

The tests were performed on: 02/07/2024 – 27/09/2024

Place of testing: Laboratories of Testing Department Ostrava

The tests were performed by: Bohdan Sousedík and Ivo Rajnošek

Data on the person who performed the test, test conditions and equipment used are listed in the Test Minutes. Apparatuses and measuring instruments that were used have been calibrated and verified pursuant to the valid plan of Ostrava Testing Department.

3.1 Determination of dimensions acc. to ČSN EN 494+A1, cl. 7.2

Table no. 1: Length, width, thickness, squareness, height of edges
values in table no. 1 are calculated arithmetic average

Sample [-]	Length [mm]	Width [mm]	Thickness [mm]	Squareness [mm]	Height of edges [mm]	
					h_{om}	h_{od}
1-1	624	1164	6.3	0.5	19	6
1-2	628	1166	6.3	0.5	19	10
1-3	625	1169	6.2	1.0	19	7
1-4	625	1165	6.2	1.0	18	9
1-5	624	1164	6.2	0.5	20	10
1-6	624	1163	6.4	0.5	18	7
1-7	627	1166	6.3	1.0	19	8
1-8	625	1164	6.3	1.5	18	7
1-9	628	1166	6.3	1.0	18	8
1-10	625	1164	6.2	0.5	19	8

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Table no. 2: Height of corrugation, pitch

values in table no. 2 are calculated arithmetic average from 3 measurement on corrugation for height of corrugation and calculated arithmetic average for pitch

Sample [-]	Height of corrugation *h* [mm]			Pitch *a* [mm]
1-1	45.8	45.5	44.9	352
1-2	45.0	44.6	46.3	350
1-3	47.2	46.5	46.9	351
1-4	46.0	45.8	44.8	349
1-5	44.7	46.2	44.6	351
1-6	46.3	45.4	44.9	349
1-7	46.1	46.1	46.4	352
1-8	47.5	46.7	47.4	352
1-9	46.6	44.9	47.1	351
1-10	45.2	46.1	47.1	351

3.2 Determination of the apparent density, determination of the water impermeability, determination of the bending moments and breaking loads and its change due to warm water tests and soak-dry tests acc. to ČSN EN 494+A1, cl. 7.3

Table no. 3: Apparent density

The results were taken from the protocol No. 070-059172 from testing laboratory No. 1018.3 due to same material of the profiled sheets

Sample [-]	Apparent density [g/cm3]
2-1	1451
2-2	1456
2-3	1455
2-4	1460
2-5	1470
2-6	1468
2-7	1474
2-8	1472
2-9	1474
2-10	1454

Table no. 5: Bending moment

samples were tested at clear span l_s = 700 mm

Sample [-]	Width [mm]	F_{max} [N]	Bending moment [Nm/m]
8-1	298.67	184	107.93
8-2	297.61	200	117.60
8-3	298.99	184	107.93
8-4	297.34	197	115.83
8-5	298.07	213	124.94
8-6	297.23	200	117.75
8-7	298.57	172	100.81
8-8	297.91	200	117.49
8-9	299.30	194	113.43
8-10	298.15	197	115.51

Table no. 6: Warm water test (56 days) for short sheets (Bending moment test)
samples were tested at clear span l_s = 700 mm

Control samples				Samples after warm water test			
Sample [-]	Width [mm]	F_{max} [N]	Bending moment [Nm/m]	Sample [-]	Width [mm]	F_{max} [N]	Bending moment [Nm/m]
6-1	294.8	134	79.55	6-11	295.4	196	116.11
6-2	297.3	141	83.00	6-12	296.8	191	112.64
6-3	296.1	153	90.43	6-13	297.1	197	116.02
6-4	297.1	173	101.90	6-14	296.2	194	114.61
6-5	296.0	144	85.14	6-15	296.1	181	106.96
6-6	297.5	147	86.47	6-16	295.3	188	111.42
6-7	296.0	165	97.55	6-17	296.3	216	127.56
6-8	296.3	142	83.87	6-18	296.6	188	110.92
6-9	296.2	169	99.85	6-19	295.8	209	123.64
6-10	295.4	172	101.90	6-20	295.2	206	122.12
average value X_1		90.96		average value X_2		116.20	
standard deviation s_1		8.56		standard deviation s_2		6.42	
mean value at 95 % confidence level L_1		86.00		mean value at 95 % confidence level L_2		112.48	
ratio R_l		**$R_l = L_2/L_1 = 1.31 > 0.70$**					

Table no. 7: Soak-dry test (50 cycles) for short sheets (Bending moment test)
samples were tested at clear span l_s = 700 mm

Control samples				Samples after soak-dry test			
Sample [-]	Width [mm]	F_{max} [N]	Bending moment [Nm/m]	Sample [-]	Width [mm]	F_{max} [N]	Bending moment [Nm/m]
7-1	295.7	176	104.41	7-11	298.1	110	64.81
7-2	298.0	179	105.23	7-12	298.2	136	80.04
7-3	297.8	189	111.05	7-13	297.1	119	69.85
7-4	299.4	122	71.08	7-14	295.3	121	71.46
7-5	298.1	159	93.46	7-15	296.3	149	87.88
7-6	298.1	184	108.26	7-16	297.1	129	75.92
7-7	297.9	194	113.96	7-17	298.2	99	57.87
7-8	297.7	175	103.00	7-18	297.2	131	76.90
7-9	298.9	203	118.97	7-19	298.1	128	75.25
7-10	296.8	188	110.60	7-20	299.2	124	72.52
average value X_1		104.00		average value X_2		73.25	
standard deviation s_1		13.47		standard deviation s_2		8.22	
mean value at 95 % confidence level L_1		96.19		mean value at 95 % confidence level L_2		68.48	
ratio R_l		**$R_l = L_2/L_1 = 0.71 > 0.70$**					

Water impermeability
On the under face of the sheets appeared traces of moisture but there were no formations of drops of water.

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3.3 Determination of freeze-thraw tests, heat-rain tests acc. to ČSN EN 494+A1, cl. 7.4

Table no. 8: Freeze-thraw test (100 cycles) for short sheets (Bending moment test)
samples were tested at clear span l_s = 700 mm

Control samples				Samples after freeze-thraw test			
Sample [-]	**Width [mm]**	**F_{max} [N]**	**Bending moment [Nm/m]**	**Sample [-]**	**Width [mm]**	**F_{max} [N]**	**Bending moment [Nm/m]**
4-1	300.5	210	122.05	4-11	300.7	175	101.95
4-2	300.8	206	120.08	4-12	300.7	203	118.25
4-3	301.2	153	89.00	4-13	300.8	184	107.30
4-4	300.6	184	107.36	4-14	300.8	197	114.50
4-5	301.4	160	92.68	4-15	300.5	194	112.99
4-6	301.3	183	106.54	4-16	301.0	194	112.81
4-7	301.1	157	91.35	4-17	300.5	181	105.52
4-8	299.3	156	91.46	4-18	300.6	181	105.49
4-9	301.5	157	91.24	4-19	300.9	222	129.10
4-10	301.0	197	114.43	4-20	299.5	182	106.13
average value X_1		102.62		average value X_2		111.40	
standard deviation s_1		13.02		standard deviation s_2		8.01	
mean value at 95 % confidence level L_1		95.07		mean value at 95 % confidence level L_2		106.76	
ratio R_l		**$R_l = L_2/L_1 = 1.12 > 0.70$**					

Heat-rain test
After 50 heat-rain cycles there are not any visible cracks, delamination or other defect in the fibre-cement sheets in such a degree, what would have effect on performance in use.

END OF THE TEST REPORT

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