



TEST REPORT No. KAM 15/60

15th April 2015
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APPLICANT **EKOBORD YENİ NESİL LEVHA VE DUVAR SİSTEMLERİ. A.Ş**
(name, address)

MANUFACTURER: _____
(if different from customer)

TEST OBJECT: **Fiber cement sheets (Category A)**
(name, normative document symbol or description, identification methods)

SAMPLE DELIVERY DATE: 2015.02.17 TEST DATE: 2015.(02.19-04.14)

TEST LOCATION: _____
(if the test was performed not in the referred laboratory)

SELECTED SPECIMENS: 2015.02.17, brought customer
(selector, selection place and time, selection act number, normative document)

TESTS PERFORMED PURSUANT TO: LST EN 12467:2012; LST EN 13523-4:2014;
LST EN ISO 1522:2007; LST EN ISO 4624:2003; LST EN ISO 2409:2013
(normative document nr. or test method, test order description)

TEST RESULTS

Run. No.	Indicator name	Test method mark	Results
1*	Bending strength: - minimum modulus of rupture MOR, MPa - classe - modulus of elasticity MOE, GPa	LST EN 12467:2012	13,01 3 7,21
2*	Apparent density, g/cm ³	LST EN 12467:2012	1,51
3	Resistance to scratching (Pencil hardness)	LST EN 13523-4:2014	5H
4	Hardness (Pendulum damping test, König method), s	LST EN ISO 1522:2007	45
5	Adhesion to fibre-cement sheet, MPa	LST EN ISO 4624:2003	1,8
6	Adhesion to fibre-cement sheet, cross-cut test, classification	LST EN ISO 2409:2013	3

OTHER INFORMATION: * not accredited testing
(any deviations, additional tests, exceptions and any other information, related to specified tests)

ATTACHMENTS: _____
(Attachment numbers and names)

Laboratory manager: _____
(Legally authorized) (signature)  M. Jucienė
(n., surname)

Engineer: _____
(Technically responsible for tests) (signature) E. Smetonaitė
(n., surname)

These test results relate only to the specific tested items.

The parts of test report cannot be multiplied without a written consent of the testing laboratory.

1. Bending strength (LST EN 12467:2012), MPa:

Table 1

Run. No.	Measurements, mm			Breaking load F, N	Modulus of rupture MOR, MPa
	Span between the axes supports, l_s	Width, b	Thickness, e		
Specimens in the parallel direction					
1	150	50,8	8,14	260	17,38
2	150	51,1	7,91	257	18,09
3	150	50,7	8,07	218	14,86
4	150	51,3	8,21	261	16,98
5	150	50,2	8,16	228	15,35
6	150	51,1	7,96	242	16,82
7	150	50,9	8,08	225	15,23
8	150	50,7	8,05	245	16,78
9	150	51,1	8,01	227	15,58
10	150	50,9	8,03	222	15,22
Average	-	-	-	239	16,23
Specimens in the perpendicular direction					
1*	150	52,3	8,21	202	12,89
2*	150	50,7	7,98	180	12,54
3*	150	52,4	7,97	166	11,22
4*	150	50,7	7,94	177	12,46
5*	150	51,2	7,96	154	10,68
6*	150	52	8,27	193	12,21
7*	150	51	8,08	183	12,37
8*	150	52,4	8	175	11,74
9*	150	51,4	7,97	179	12,34
10*	150	51,6	7,94	178	12,31
Average	-	-	-	179	12,08

Specimens for test prepared in Ecobord manufacture.

Specimens conditioned for 7 days in conditions: temperature $(23 \pm 2)^\circ\text{C}$ and a relative humidity $(50 \pm 2) \%$. After that 24 h immersed in water $(23 \pm 2)^\circ\text{C}$. The radius of support 10 mm, breakage occurs within 12-20 s. Average of modulus of rupture MOR of specimens pairs (in parallel and perpendicular directions):

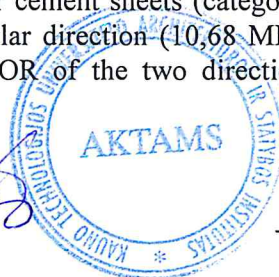
Table 2

Average of modulus of rupture MOR, MPa	Specimens pairs									
	1/1*	2/2*	3/3*	4/4*	5/5*	6/6*	7/7*	8/8*	9/9*	10/10*
	15,14	15,32	13,04	14,72	13,01	14,51	13,80	14,26	13,96	13,77

According the minimum modulus of rupture MOR fiber cement sheets (category A) corresponds classe 3. The minimum modulus of rupture MOR in perpendicular direction (10,68 MPa) is not less 70 % of the specified value for classe 3 for minimum average MOR of the two directions (LST EN 12467:2012, p. 5.4.4., table 6).

Tests performed by:


(signature)



V. Sacevičienė
(n., surname)

Table 3

Run. No.	Span between the axes supports, l_s	Width, b	Thickness, e	Load F_1 , N	Load F_2 , N	Deflection f_1 , mm	Deflection f_2 , mm	Modulus of elasticity E, GPa
Specimens in the parallel direction								
1	150	50,5	8,14	100	280	0,35	0,93	9,61
2	150	50,3	8,02	100	300	0,35	0,9	11,82
3	150	50,5	7,92	100	300	0,41	1,15	9,09
4	150	50,2	7,98	100	300	0,43	1,2	8,59
5	150	50,2	8,25	100	300	0,32	0,88	10,69
Average	-	-	-	-	-	-	-	9,96
Specimens in the perpendicular direction								
1	150	50,4	8,04	60	140	0,38	0,79	6,29
2	150	50,3	7,95	100	140	0,56	0,87	4,31
3	150	50,1	8,14	100	140	0,55	1,04	2,55
4	150	50,2	8,02	80	120	0,62	0,92	4,34
5	150	50,5	8,01	80	120	0,48	0,75	4,82
Average	-	-	-	-	-	-	-	4,46
Modulus of elasticity MOE, GPa	-	-	-	-	-	-	-	7,21

Specimens for test prepared in Ecobord manufacture.

Specimens conditioned for 14 days in conditions: temperature $(23 \pm 2)^\circ\text{C}$ and a relative humidity $(50 \pm 2) \%$. Breakage occurs within 12-20 s. Specimens deflection f_1 corresponding to the load F_1 , deflection f_2 corresponding to the load F_2 (LST EN 12467:2012, p. 7.3.2.4.2).

2. Apparent density (LST EN 12467:2012, p. 5.4.2.) , g/cm^3 :


Table 4

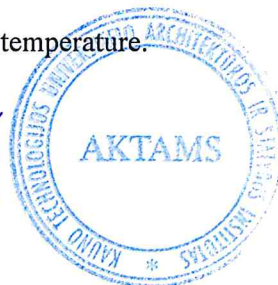
Run. No.	Mass of the specimen after drying, g	Volume of the specimen, cm^3	Apparent density, g/cm^3
1	119,65	81,44	1,47
2	125,1	81,38	1,54
3	126,66	81,42	1,56
4	124,45	81,53	1,53
5	121,61	80,64	1,51
6	127,54	81,50	1,56
7	107,87	80,92	1,33
8	124,77	81,09	1,54
9	123,97	81,03	1,53
10	123,42	80,78	1,53
Average	122,50	81,09	1,51

Specimens for test prepared in Ecobord manufacture.

Specimens dried in ventilated oven 24 h at $(102 \pm 2)^\circ\text{C}$ temperature.

Tests performed by:


(signature)



V. Sacevičienė
(n., surname)

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3. Resistance to scratching (Pencil hardness) (LST EN 13523-4:2002) – pencil hardness 5H – no scratches.

Specimens for test prepared in Ecobord manufacture.

Film thickness ~45 µm (measured according LST EN ISO 2808:2007, 4A method).

4. Hardness (Pendulum damping test, König method) (LST EN ISO 1522:2007), s: 46,2; 42,0; 42,0; 50,4; 46,2.

Specimens for test prepared in Ecobord manufacture.

Specimens conditioned for 7 days in conditions: temperature (23 ± 2)°C and a relative humidity (50 ± 2) %.

The time of the amplitude of the glass 244 s.

Film thickness ~45 µm (measured according LST EN ISO 2808:2007, 4A method).

5. Adhesion to fibre-cement sheet (LST EN ISO 4624:2003), MPa:

Specimens for test prepared in Ecobord manufacture.

Film thickness ~45 µm (measured according LST EN ISO 2808:2007, 4A method).

Table 5

Run. No.	Breaking strength, MPa	The type of fracture
1	2,1	45 % A + 55 % A/B
2	2	30 % A + 70 % A/B
3	1,5	20 % A + 80 % A/B
4	1,8	60 % A + 40 % A/B
5	1,9	100 % A/B
6	1,6	20 % A + 80 % A/B
Average:	1,8	

For testing used P.A.T. GM 01, diameter of dolles 20 mm.

A – cohesive failure of substrate, A/B – adhesive failyre between substrate and first coat.

6. Adhesion to fibre-cement sheet, cross-cut test (LST EN ISO 2409:2013), classification:

Specimens for test prepared in Ecobord manufacture.

Film thickness ~45 µm (measured according LST EN ISO 2808:2007, 4A method).

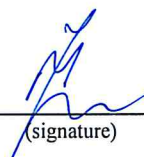
Specimens conditioned for 2 days in conditions: temperature (23 ± 2)°C and a relative humidity (50 ± 2) %.

Table 6

Run. No.	Classification
1	3
2	3
3	3

The type of cutting – manual, 2 mm spacing. For removing loose paint adhesive tape was used.

Tests performed by:


(signature)



M. Juciėnė
(n., surname)