

## SUMMARY TEST REPORT

<b>Applicant:</b>	<b>FIBRAN S.A.</b> 56010 THESSALONIKI Greece
<b>Content:</b>	Insulation component test of mineral wool used in ETICS according ETAG 004 (2013) and EAD 040083-00-0404
<b>Material Identification:</b>	Thermal insulation products for buildings - Factory made mineral wool (MW) products <b>FIBRANgeo</b> <b>“BP-ETICSplus”</b> Rock mineral wool board with conventional binder
<b>Sampling:</b>	The samples were sent by the applicant to FIW München. Goods receipt no.: WE17-3332, date: 12.07.2017 Goods receipt no.: WE23-1032, date: 31.01.2023
<b>Production unit:</b>	<b>FIBRAN S.A.</b> <b>Terpni, Serres, Greece</b>
<b>Report No.:</b>	<b>L1-23-086a</b>
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**Procedure:**

The testing laboratory FIW München (notified body No. 0751) was asked by

**FIBRAN S.A., Greece**

to carry out the Insulation component test of mineral wool used in ETICS ETAG 004 (2013).

The samples were produced according to the manufacturer at the manufacturing plant

**FIBRAN S.A., Terpni, Serres, Greece**

and sent to FIW München.

The sample boards were produced with conventional binder, a thickness range between 50 mm and 400 mm and a density range between 82 kg/m<sup>3</sup> and 108 kg/m<sup>3</sup>.

BP-ETICSplus, nominal thickness 50 mm, Lot-No.: 13 0181 016 C

BP-ETICSplus, nominal thickness 400 mm, Lot-No.: 22 3603 410 D

BP-ETICSplus, nominal thickness 60 mm, Lot-No.: 27 1603 150 D

The tests are only referring to the insulation component test of mineral wool (5.2) used in the ETICS including the identification test according to Annex C for insulation components, but without any system tests, guidelines or requirements of any national Technical Assessment Body (TAB) or customer.

The following tests were conducted according the request of the applicant on the smallest and greatest thickness:

- Determination of density according to ETAG 004 Annex C.2.1
- Determination of dimensional characteristics and appearance according to ETAG 004 Annex C.2.2
  - Determination of length and width according to ETAG 004 Annex C.2.2.1
  - Determination of thickness according to ETAG 004 Annex C.2.2.2
  - Determination of squareness according to ETAG 004 Annex C.2.2.3
  - Determination of flatness according to ETAG 004 Annex C.2.2.4
- Compression test according to ETAG 004 Annex C.2.3
- Dimensional stability test according ETAG 004 Annex C.2.4
- Hygiene, health and the environment test according to ETAG 004 Chapter 5.2.3
  - Water absorption according to ETAG 004 Chapter 5.2.3.1 and EAD Chapter 2.2.5
- Safety in use according to ETAG 004 Chapter 5.2.4
  - Tensile test perpendicular to faces according to ETAG 004 Chapter 5.2.4.1 and EAD Chapter 2.2.14.2
    - In dry conditions according to ETAG 004 Chapter 5.2.4.1.1
    - In wet conditions according to ETAG 004 Chapter 5.2.4.1.2 after 7 days storage
    - In wet conditions according to ETAG 004 Chapter 5.2.4.1.2 after 28 days storage
- Safety in use according to ETAG 004 Chapter 5.1.4 (informative test on the ETICS) and EAD Chapter 2.2.13
  - Wind load resistance of mechanically fixed ETICS
    - Pull-Through in dry and wet conditions according to ETAG 004 Chapter 5.2.4.3.1
- Dynamic stiffness according to EAD Chapter 2.2.22.2

Additional the following test was conducted on 60 mm thickness as prescribed to ETAG 004:

- Shear strength and shear modulus of elasticity test according to ETAG 004 Chapter 5.2.4.2 and EAD Chapter 2.2.15

## Results:

The test results are made up in the following tables.

**Table 1: Determination of density according to ETAG 004 Annex C.2.1**

For the determination of the dimensional characteristics, appearance and density always the complete board is measured. The amount of tested boards is in each case written in brackets.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Measured mean density according to ETAG 004 Annex C.2.1 In conjunction with EN 1602:2013 (30 / 30 single values)	[kg/m <sup>3</sup> ]	108	82

**Table 2: Determination of dimensional characteristics and appearance according to ETAG 004 Annex C.2.2**

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Measured mean value according to ETAG 004 Annex C.2.2.2 In conjunction with EN 823:2013 (30 / 30 single values)	[mm]	51,3	399
Nominal length according to labelling	[mm]	1000	1000
Measured mean value according to ETAG 004 Annex C.2.2.1 In conjunction with EN 822:2013 (30 / 30 single values)	[mm]	1000	1000
Nominal width according to labelling	[mm]	600	600
Measured mean value according to ETAG 004 Annex C.2.2.1 In conjunction with EN 822:2013 (30 / 30 single values)	[mm]	600	600
Measured squareness according to ETAG 004 Annex C.2.2.3 In conjunction with EN 824:2013 (30 / 30 single values)	[mm/m]	1 / 1	1 / 1
Measured flatness according to ETAG 004 Annex C.2.2.4 In conjunction with EN 825:2013 (30 / 30 single values)	[mm/m]	1	1

Results relate only on the items tested.

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Testing body accredited by DAkkS according to EN/ISO IEC 17025:2017 according to the certification annex D-PL-14116-01-00.

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**Table 4: Compression test according to ETAG 004 Annex C.2.4**

The size of the tested samples is 200 mm x 200 mm x product thickness.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Compressive strength or compressive stress at 10 % compression Measured mean value regarding compressive stress at 10 % compression according to ETAG 004 Annex C.2.3 In conjunction with EN 826:2013 (mean of 5 single values)	[kPa]	22	24
Single values	[kPa]	23 / 23 / 23 / 20 / 21	26 / 23 / 25 / 22 / 26
Declared level by labelling	[kPa]	20	20

**Table 5: Determination of dimensional stability test according ETAG 004 Annex C.2.4**

The size of the tested samples is 200 mm x 200 mm x product thickness.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Dimensional stability (48 h, 70 °C, 90 % R.H.) Measured mean value regarding dimensional stability according to ETAG 004 Annex C.2.4 In conjunction with EN 1604:2013 (mean of 3 single values)			
length $\Delta_{el}$	[%]	0	-0,1
width $\Delta_{eb}$	[%]	+0,1	+0,4
thickness $\Delta_{ed}$	[%]	+0,4	+0,2

**Table 6: Safety in use according to ETAG 004 Chapter 5.2.4 - Tensile test perpendicular to faces**

The size of the tested samples is 200 mm x 200 mm x product thickness and identical in dry and wet conditions. The wet condition testing is performed as a two test series with a minimum of 8 samples exposed to heat-moisture actions at  $(70 \pm 2) ^\circ\text{C}$  and  $(95 \pm 5) \% \text{ R.H.}$  in a climatic chamber.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Tensile test perpendicular to faces according to ETAG 004 Chapter 5.2.4.1			
In dry conditions according to ETAG 004 Chapter 5.2.4.1.1			
Measured mean value $\bar{\sigma}_{mt}$ In conjunction with EN 1607:2013 (mean of 5 single values)	[kPa]	8,0	14
Single values	[kPa]	8,0 / 7,8 / 9,2 / 7,3 / 7,8	14 / 14 / 14 / 14 / 14
Declared level by labelling	[kPa]	7,5	7,5
In wet conditions according to ETAG 004 Chapter 5.2.4.1.2 after 7 days storage			
Measured mean value $\bar{\sigma}_{mt}$ In conjunction with EN 1607:2013 (mean of 8 single values)	[kPa]	4,7	6,0
Single values	[kPa]	4,3 / 4,2 / 3,7 / 4,9 / 5,7 / 4,1 / 5,2 / 5,2	5,7 / 6,0 / 6,0 / 6,1 / 6,2 / 6,4 / 5,8 / 5,9
In wet conditions according to ETAG 004 Chapter 5.2.4.1.2 after 28 days storage			
Measured mean value $\bar{\sigma}_{mt}$ In conjunction with EN 1607:2013 (mean of 8 single values)	[kPa]	4,3	4,6
Single values	[kPa]	4,7 / 3,8 / 5,0 / 4,2 / 4,0 / 4,3 / 4,0 / 4,4	3,3 / 5,5 / 4,7 / 3,3 / 5,5 / 4,5 / 4,6 / 5,5

**Table 7: Hygiene, health and the environment test according to ETAG 004 Chapter 5.2.3**

The size of the tested samples is 200 mm x 200 mm x product thickness.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Short term water absorption Measured mean value $W_p$ regarding water absorption according to ETAG 004 Chapter 5.2.3.1 In conjunction with EN 1609:2013 (mean of 4 single values - 2 from each side)	[kg/m <sup>2</sup> ]	0,11	0,06
Requirement according ETAG 004 Chapter 6.2.3.1 (mean value)	[kg/m <sup>2</sup> ]	≤ 1,0	≤ 1,0
Long term water absorption Measured mean value $W_{lp}$ In conjunction with EN 12087 (mean of 4 single values - 2 from each side)	[kg/m <sup>2</sup> ]	0,72	0,10
Requirement according EN 13162 (mean value)	[kg/m <sup>2</sup> ]	≤ 3,0	≤ 3,0

**Table 8: Safety in use according to ETAG 004 Chapter 5.2.4 – Shear strength and shear modulus of elasticity test**

The test is performed according to the application in width direction of the boards. Sample size is 200 mm x 100 mm x thickness. For products with a nominal thickness exceeding 60 mm the thickness of specimen were reduced to 60 mm including the surface of the sample. The test method is the double sample procedure.

Test	Products	
	BP-ETICSplus	
Nominal thickness according to labelling	[mm]	60
Shear strength Measured mean value $\tau$ according to ETAG 004 Chapter 5.2.4.2 In conjunction with EN 12090:2013 (mean of 5 single values)	[kPa]	25
Single values $\tau$	[kPa]	25 / 23 / 26 / 25 / 26
Requirement according ETAG 004 Chapter 6.2.4.2 (minimum value) - Typical requirement for products not used with dowels (e.g. lamellas)	[kPa]	≥ 20
Shear modulus Measured mean value $G_m$ according to ETAG 004 Chapter 5.2.4.2 In conjunction with EN 12090:2013 (mean of 5 single values)	[kPa]	1060
Requirement according ETAG 004 Chapter 6.2.4.2 (mean value) - Typical requirement for products not used with dowels (e.g. lamellas)	[kPa]	≥ 1000

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**Table 9: Test on the ETICS - Safety in use - Pull-through tests of fixings according ETAG 004 Chapter 5.1.4**

As ruptures occur in the edge during prior pull-through tests on mineral wool products the sample dimensions were increased to 500 mm x 500 mm (as recommended according to ETAG 004 Chapter 5.1.4.3.1).

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Pull-through tests of fixings according ETAG 004 Chapter 5.1.4.3.1			
Diameter of the used anchor plate	[mm]	60	60
Used anchor		ejotherm STR U	
Measured mean value maximum load in dry conditions according to ETAG 004 Chapter 5.1.4.3.1 (mean of 5 single values)	[N]	313	593
Single values: maximum load	[N]	308 / 308 / 322 / 366 / 261	707 / 543 / 617 / 542 / 556
Measured mean value maximum load in wet conditions according to ETAG 004 Chapter 5.1.4.3.1 in conjunction with 5.2.4.1.2 (mean of 5 single values)	[N]	211	392
Single values: maximum load	[N]	204 / 200 / 258 / 215 / 178	434 / 409 / 368 / 361 / 388

**Table 10: Dynamic stiffness of the thermal insulation product according**

The size of the tested samples is 200 mm x 200 mm x product thickness.

Test	Products		
	BP-ETICSplus		
Nominal thickness according to labelling	[mm]	50	400
Dynamic stiffness			
Measured mean value of dynamic stiffness In conjunction with EN 29052-1	[MN/m <sup>3</sup> ]	11,8	3,0

**Remarks:**

The test results are only valid for the tested specimens under the tested conditions.

**Conclusion:**

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Gräfelfing, 10.07.2024

Test Expert

C. Ring, M. Sc.



Editor

B. Kuttner

