

Customer Name: Pakan Atiye Nano Danesh

Customer Address: NO.78, Zaferaniye, North Naderi St, Qazvin

Sample Name: Sample

Client Reference Number: 980312

Laboratory Environmental Conditions: Temperature : Moisture: Attachments:
Sampling was done by the customer.

Date Of Issue: 2020/5/17
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 Revision No.: 0
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Sound Insulation Test

Test reference: laboratory Internal Instruction

Test description:

In order to evaluate the insulation capability of the sample, the specimen was placed in a chamber in a position to act as an obstacle to sound transmission. In this case, the intensity of sound was measured by making sound with different intensity and frequency on one side of the sample and measuring the intensity of sound on the other side the reduction in sound intensity was measured. Finally, comparing the obtained numbers, the sound insulation status of the sample was evaluated.

Test result:

The test results are shown in the table below. The intensity of the sound in the laboratory environment is 48.2 dB.

Table 1- Test result

Position	Frequency 100 Hz	Frequency 440 Hz	Frequency 1000 Hz	Frequency 10000 Hz
	sound intensity	sound intensity	sound intensity	sound intensity
Measurement in the presence of a sample (dB)	81.8	102.2	84.6	65.4
measurement without sample (dB)	102.3	115.3	113.7	114.7
Sound reduction level (dB)	20.5	13.1	29.1	49.3

*Specimen thickness: 11.5 mm



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Expert
Isfahani

B. Jafarian
Technical Manager



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Determination of Maximum Exothermic Temperature Rise Test

Test reference: ASTM D 1728 (2017) / ASTM C 411 (2019)/ ASTM C 447 (2015)

Test description:

The test was performed on a specimen with dimensions of 457 mm × 152 mm × 11.5 mm. The specimen was placed on a Hot- Plate furnace for 96 hrs and the temperature was brought to 649°C and kept constant during the test. According to the standard, the increase in temperature of the inner layer of the specimen during the test should not be more than 111°C from the test temperature (649°C).

Test result:

No increase in temperature was observed in the inner layer of the specimen.



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B. Mohammad Pour
Technical Manager

Laboratory Manager
M. Jaferian

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Customer Address: NO.78, Zaferaniye, North Naderi St, Qazvin

Sample Name: Sample

Client Reference Number: 980312

Laboratory Environmental Conditions: Temperature: 23°C Moisture: 53% Attachments:

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The test has been done by secondary contractor.

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Thermal Conductivity Coefficient Test

According to: ASTM C177-19

- Results of test:

Row	Thermal Conductivity Coefficient, λ_D (W/m. $^{\circ}$ K)	Temperature, T ($^{\circ}$ C)
1	0.0221 $\pm$ 5%	20
2	0.054 $\pm$ 5%	400
3	0.079 $\pm$ 5%	600



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Compression Test

According to: ASTM C 165-2017

Results of pressure test:

No.	Dimension (mm*mm)	Initial Area (mm ²)	Speed (mm/min)	Height (mm)	Compressive Deflection (mm)			Force (N)			Compressive Strength (MPa)		
					@ 30% compression	@ 50% compression	@ 70% compression	@ 30% compression	@ 50% compression	@ 70% compression	@ 30% compression	@ 50% compression	@ 70% compression
1	52.99*53.28	2823.31	1.3	11.69	3.51	5.85	8.18	434.79	1589.52	4884.32	0.154	0.563	1.73
2	56.45*52.15	2943.87	1.3	12.33	3.70	6.17	8.63	353.26	1342.40	4298.05	0.120	0.456	1.46
3	54.56*53.06	2894.95	1.3	10.85	3.26	5.43	7.60	512.41	1679.07	4718.77	0.177	0.580	1.63
4	54.83*53.93	2956.98	1.3	12.78	3.83	6.39	8.95	428.76	1762.36	5884.39	0.145	0.596	1.99
Average											0.149	0.549	1.70

Notes

- Prior to testing the specimens were conditioned @ standard laboratory conditions (23±2°C & 50±5% relative humidity) for 24 hours.
- According to the standard, at least 4 specimens shall be tested.
- Regarding the nature of sample, compression force at 30%, 50% and 70% deflection were reported.



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Sasan Moghaddam

Technical Manager
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Laboratory Manager
M. Jaferian

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Apparent Density Determination

According to: ASTM C167-2015

Results of density test:

No.	Apparent Density	
	(g/cm ³)	(kg/m ³)
1	0.181	181
2	0.204	204
3	0.215	215
4	0.197	197
5	0.211	211
average	0.202	202



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[Signature]

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 Laboratory Manager



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Resistance to vibration Test

Test reference: ASTM C 592 (2016)

Test description:

A specimen with dimensions of 610 mm × 914 mm and full-thickness was prepared. The vertical distance measurement from the horizontal surface to obtain sag measurement at 40 points was done. Then the specimen was placed at Hot- Plate furnace at 399°C for 5 hours. In the following, the sample was then subjected to a vibration test with a frequency of 12 Hz and a total range of 3 mm for 6 hours. Finally, weight and sagging measurements were repeated again.

Test result:

Parameter	Before test	After test
Weight (gr)	1393.7	1374.4
Average length (mm)	916.40	912.45

Value	Result	Acceptance criteria	Status
Weight change (%)	1.38	Max: 15%	Accept
Sagging test in length (mm)	3.95	Max: 76 mm	Accept



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Linear Shrinkage Test

Test reference: ASTM C 1728 (2017)/ ASTM C 356 (2017)

Test description:

Four specimen with dimension of 152.4 mm × 63.5 mm and full thickness were prepared. Then they were dried at oven with temperature of 121°C for 48 hrs. At the following, their length and width were measured. The specimens were then placed in the furnace in the order specified in the standard for 24 hrs and the temperature was brought to 649°C. At the end, the specimens were removed from the furnace and after cooling to room temperature, the dimensions were measured again and shrinkage was measured.

Test result:

No changes in appearance were observed. During the time, no flaming during the increase in furnace temperature was observed.

No.	Linear shrinkage in length	Linear shrinkage in width
1	0.87	0.73
2	0.75	0.74
3	0.91	0.82
4	0.95	1.01
Average	0.87	0.83

* According to the requirements of ASTM C 1728 (2017) standard: Linear shrinkage in length and width of the sample should be less than 2%.



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Flexibility or Rigidity of Mineral Fiber Blanket

Standard reference: ASTM C 1101 (2017)/ ASTM D 1728 (2017)

Test description:

According to the standard instruction, the 305 mm × 305 mm specimen was bent on an Iron pipe with an outer diameter of 21.3 mm (NPS ¾ in) through an angle of 90° and then the outer surface was visually inspected for visible rupture.

Test result:

- No rupture was observed.
- The specimen returned to its original state after release.

Therefore, according to the obtained results, the sample type is of the resilient flexible.



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Hot Surface Performance Test

Test reference: ASTM D 1728 (2017) / ASTM C 411 (2019)/ ASTM C 447 (2015)

Test description:

The test was performed on a specimen with approximate dimensions of 457 mm × 152 mm × 11.5 mm. The specimen was placed on a metal surface with a temperature of 649°C for 96 hr. The metal surface temperature was kept constant throughout the test. After the test, the warpage of the specimen (if warpage) is measured.

Test result:

- No warpage was observed.
- During the test, no evidence of flaming, glowing, smoldering, smoking, melting or dripping was observed.
- After the test, no defects such as cracking and delamination were observed in the specimen.



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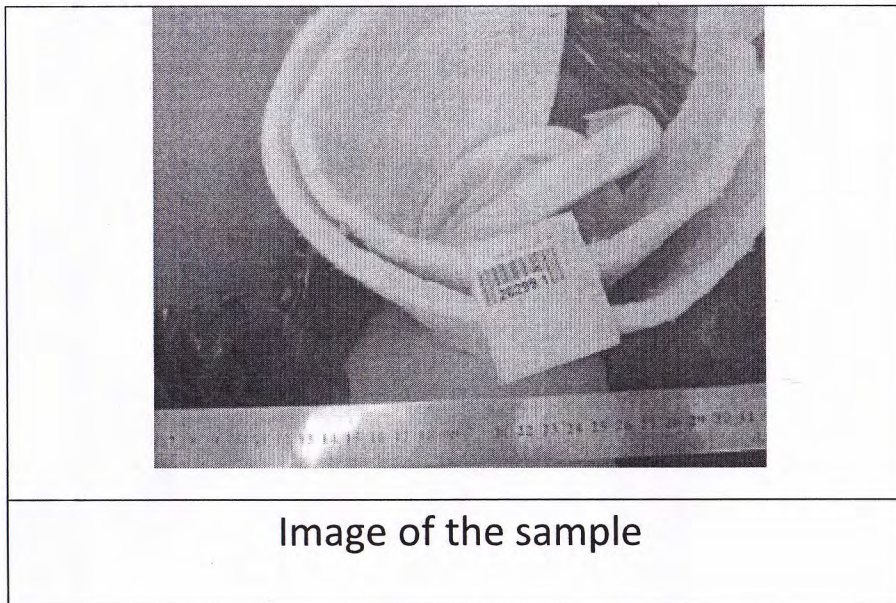


Image of the sample



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