



TEST REPORT



No. : CT22-106960E

1. Client

- Name : ALCODAEA Co.,LTD.
- Address : 276, Daechong-ro, Samseong-myeon, Eumseong-gun, Chungcheongbuk-do, Republic of Korea
- Date of Receipt : 2022.11.11

2. Specimen

- Specimen Name : Embo core - 3 mm
- Scope : Exterior Finishing Material
- Product Number : -

3. Test Standard : MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84 「Quality Certification and Management Standard for Building Materials」

4. Use of Report : Quality control

5. Test Period : 2022.11.11 ~ 2022.12.14

6. Test Condition : Refer to the next page

7. Test Results

The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 23, Subparagraph 1, on Non-combustibility test
 The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 23, Subparagraph 2, on Gas-toxicity test

Confirmation	Tested by	Lee Hwan Woong 이환웅	Technical Officer	CH01, Joung Yoon Jung Yoon Chi
	Name		Name	

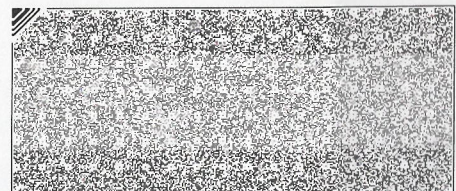
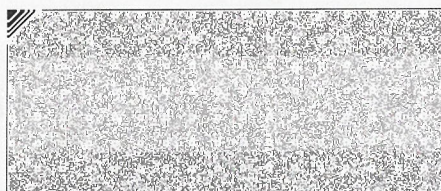
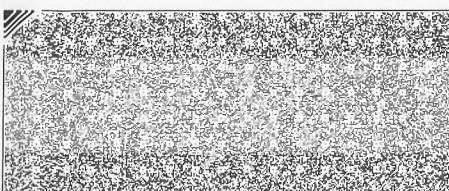
Issue Date : 2022.12.14

Korea Conformity Laboratories

President Jo, Yung Tae

※ This test report is valid for 3 year from the date of issue.

Result Inquiry : 73, Yangcheong 3-gil, Ochang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea (82-43-718-9031)



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8. Test Results

Scope	Test items	Unit	Test results			Criteria	Test method	Location
			1 st	2 nd	3 rd			
EX-T-E-R-I-O-R	Non-Combustibility test	Mass loss rate	%	0.2	0.1	0.2	≤ 30	
		Difference between maximum temperature and final temperature	℃	2.0	1.6	1.5	< 20	(1) A
	Gas Toxicity Test	Average stop motion time of laboratory mouse	min:s	14:42	14:57	-	≥ 9:00	

※ The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 23, Subparagraph 1, on Non-combustibility test.

※ The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 23, Subparagraph 2, on Gas-toxicity test.

※ According to Article 29, Clause 4 of MOLIT Notification No. 2022-84, this test report is valid for 3 year from the date of issue.

※ Test method

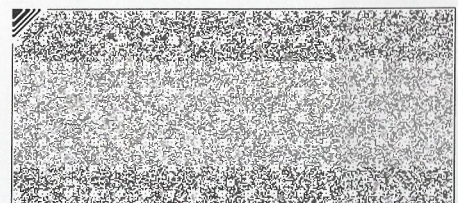
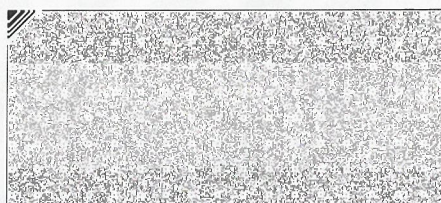
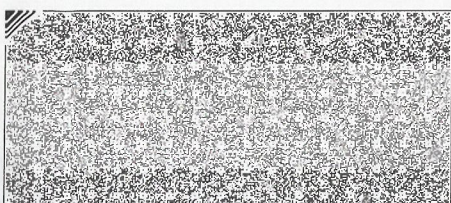
(1) MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84

※ Location

A. 73, Yangcheong 3-gil, Ochang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea

※ Note

1. This report is accredited by KOLAS. Our report apply only to the standards or procedures identified and to the sample(s) tested unless otherwise specified.
2. The test results are not indicative of representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products.
3. The results of using only a portion of this report cannot be guaranteed.
4. The authenticity of this test report can be checked on KCL website(www.kcl.re.kr).



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■ Non-combustibility test Conditions

Test date	Dec. 01. 2022.		
Test condition	Temp. (20.6 ~ 20.8) °C , Humidity (21 ~ 23) % R.H.		
Test duration (min)	20	Test method	KS F ISO 1182:2020

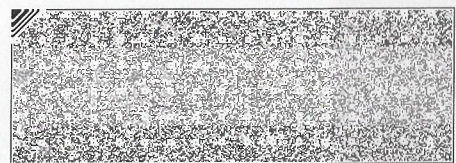
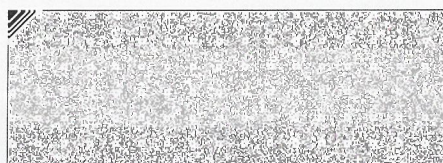
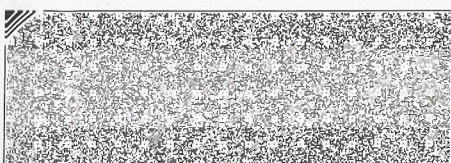
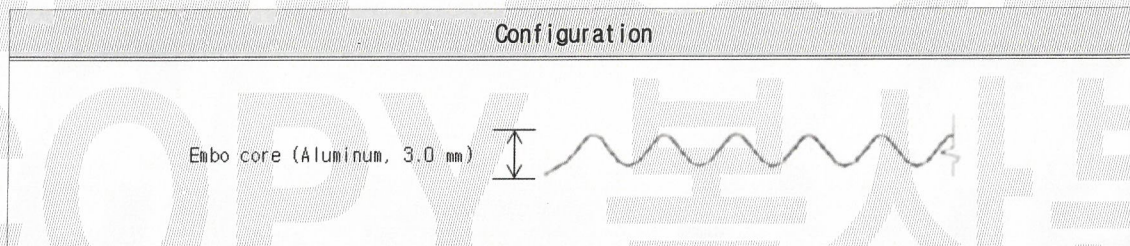
■ Test Specimen Specification [Non-combustibility test]

Diameter (mm)		43.8		43.1		43.8
Height (mm)		48.5		47.2		47.8
Mass (g)	Specimen 1	27.0	Specimen 2	25.6	Specimen 3	26.9
Density (kg/m ³)		369.3		371.9		373.7
Core density (kg/m ³)		-		-		-
Pretreatment	Temp. (23 ± 2) °C , Humidity (50 ± 5) % R.H.					

■ Test Specimen Configuration(Provided by the client)

Configuration	Quality	Manufacturer	Model	Thickness
Embo core - 3 mm	3003 H 14	Choil Aluminum	-	3.0 mm

■ Configuration(Provided by the client)

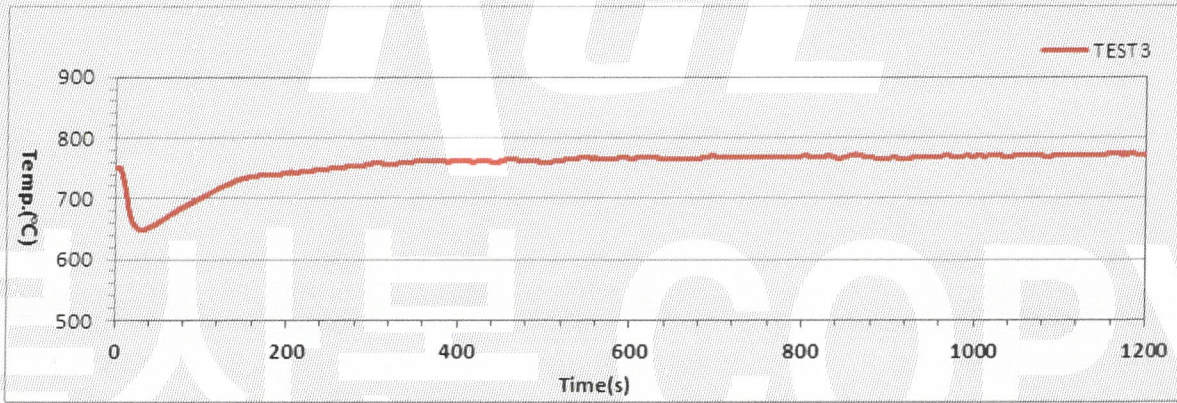
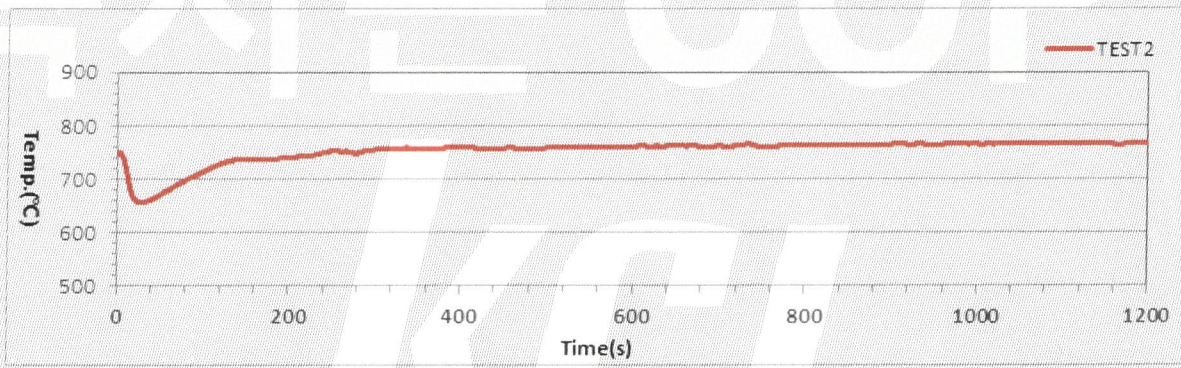
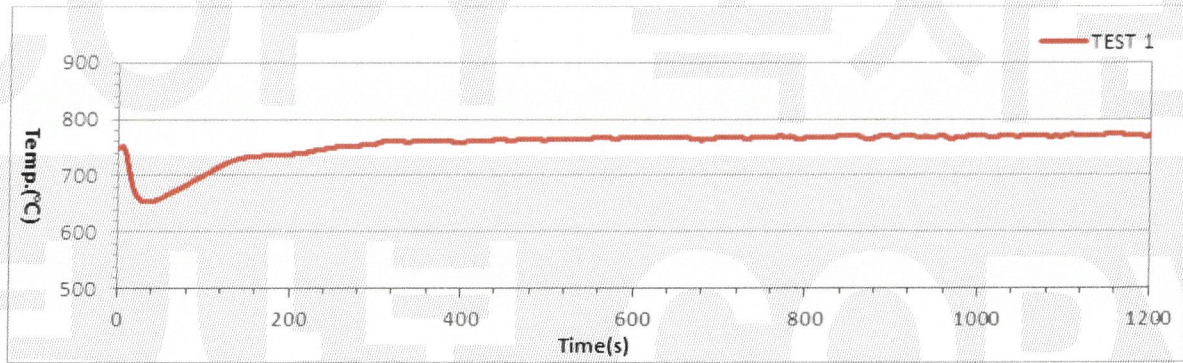


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Temperature Graph of Non-combustibility Test



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■ Gas Toxicity Test Result

Test item	Unit	Test results		Test method
		1 st	2 nd	
Average time of laboratory mouse stopped moving	min:sec	14:42	14:57	KS F 2271:2021

■ Gas Toxicity Test Conditions

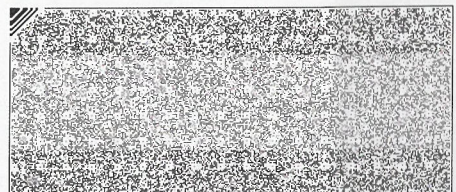
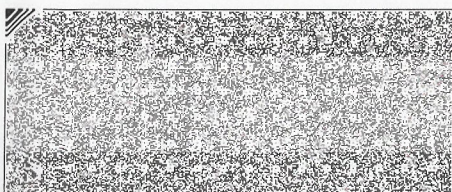
Heating condition	After heating with an auxiliary heat source(LPG) for 3 minutes, use the main heat source(furnace) to heat for additional 3 minutes.				
Heating face of specimen (Provided by client)	Both sides are identical				
Test condition	Temp. (15.1 ~ 18.3) °C , Humidity (41 ~ 42) % R.H.				
Test duration (min)	15				
Laboratory mouse	Type	ICR group female	Age	5 weeks	Weight (18 ~ 22) g

■ Test Specimen Specification [Gas Toxicity Test]

Item	Specimen 1	Specimen 2
Width (mm)	220	220
Length (mm)	220	220
Thickness (mm)	3.0	3.0
Mass (g)	50.9	50.9
Density (kg/m ³)	358.7	357.9
Core density (kg/m ³)	-	-
Pretreatment	Temp. (23 ± 2) °C , Humidity (50 ± 5) % R.H.	

■ Ending report of animal test

Committee approval number	1A22-03036
the date of approval by the committee	2022. 12. 08.
Project name	Testing method for gas toxicity of finish materials of buildings (Embo core - 3 mm)



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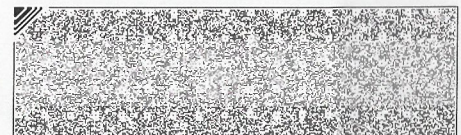
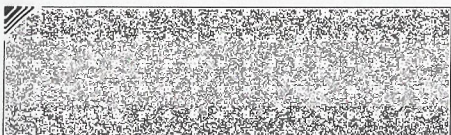
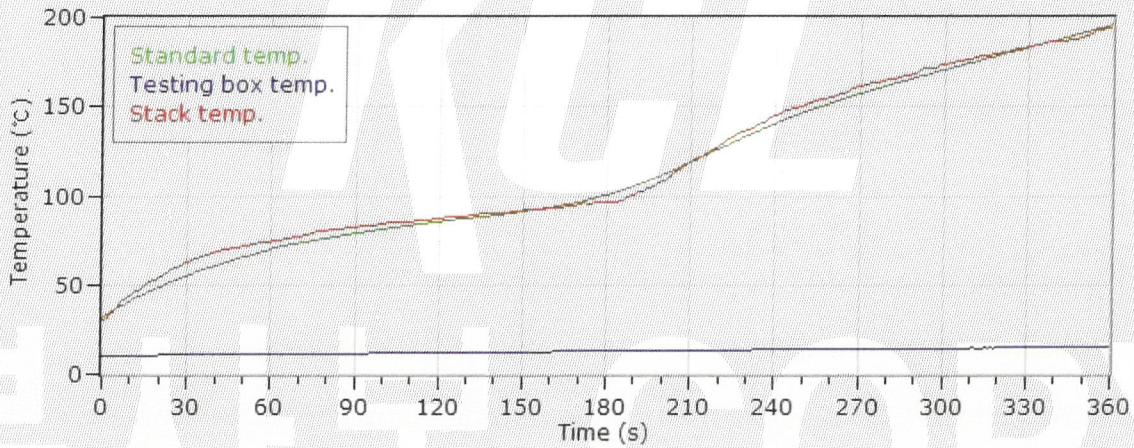
■ Standard Sample Test

- Test sample : Fiber-reinforced calcium silicate board

< Exhaust Temperature >

Time (s)	Standard Temp. (°C)	Measured Temp. (°C)	Temp. deviation (°C)
0.0	30.0	30.0	0.0
60.0	70.0	73.9	3.9
120.0	85.0	86.6	1.6
180.0	100.0	95.7	-4.3
240.0	140.0	144.4	4.4
300.0	170.0	173.3	3.3
360.0	195.0	193.5	-1.5

< Exhaust Temperature Curve >



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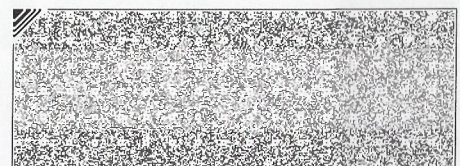
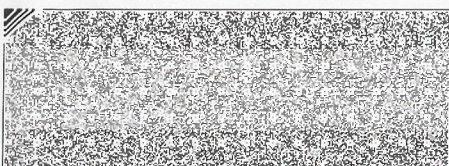
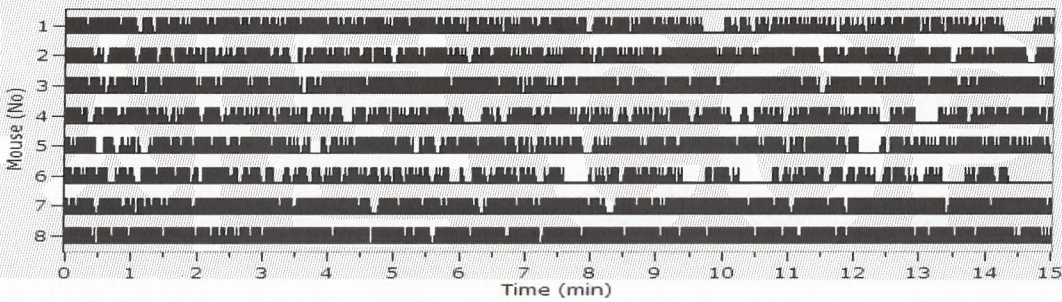
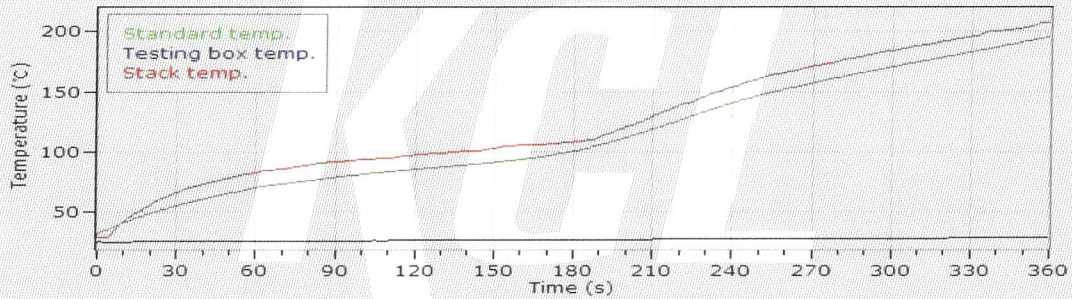


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■ Gas Toxicity Test Results (Specimen 1)

Elapsed time (s)	Measured temp. (°C)
0.0	28.1
60.0	82.3
120.0	97.1
180.0	107.8
240.0	153.4
300.0	183.7
360.0	207.2

Treadmill	Time of stop moving
M1	15 min 00 s
M2	15 min 00 s
M3	15 min 00 s
M4	15 min 00 s
M5	14 min 58 s
M6	14 min 20 s
M7	15 min 00 s
M8	15 min 00 s
Average	14 min 55 s
Standard deviation	00 min 13 s
Test result	14 min 42 s



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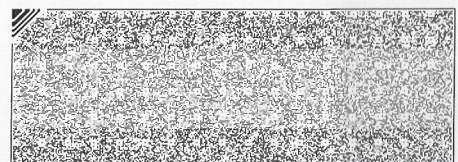
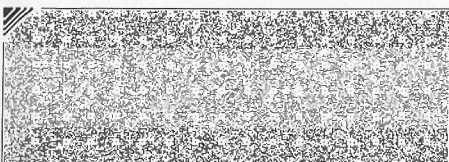
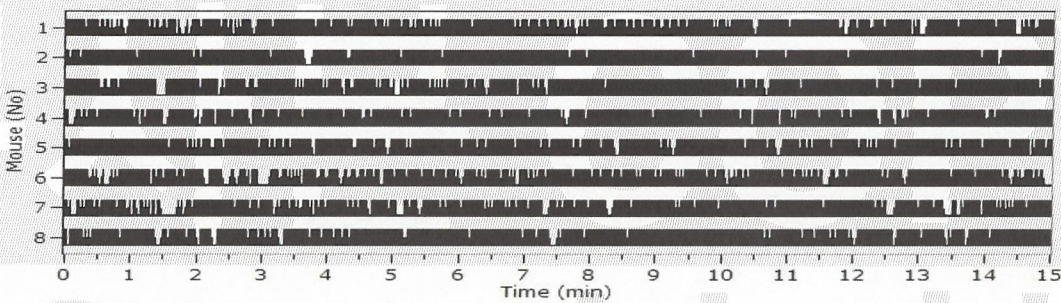
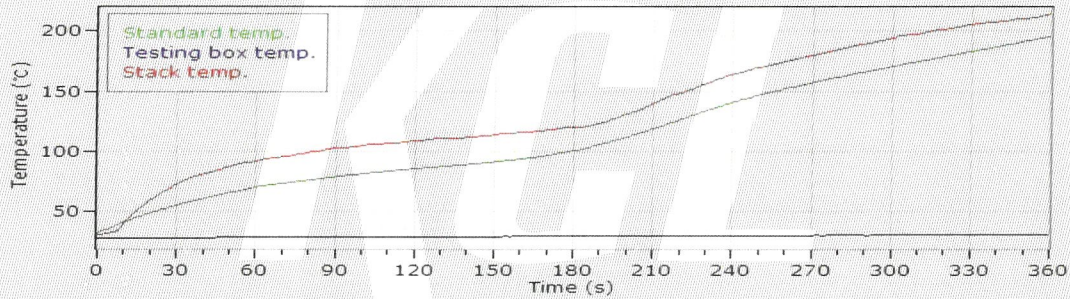


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■ Gas Toxicity Test Results (Specimen 2)

Elapsed time (s)	Measured temp. (°C)
0.0	30.0
60.0	91.0
120.0	108.4
180.0	119.6
240.0	163.8
300.0	193.5
360.0	214.0

Treadmill	Time of stop moving
M1	15 min 00 s
M2	15 min 00 s
M3	15 min 00 s
M4	15 min 00 s
M5	15 min 00 s
M6	14 min 53 s
M7	15 min 00 s
M8	15 min 00 s
Average	14 min 59 s
Standard deviation	00 min 02 s
Test result	14 min 57 s



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■ Photograph of Specimen Before/After Test

< Non-combustibility test >

Photograph of Specimen Before Test			Photograph of Specimen After Test		
Specimen 1	Specimen 2	Specimen 3	Specimen 1	Specimen 2	Specimen 3

< Gas Toxicity Test >

Photograph of Specimen Before Test	Photograph of Specimen After Test

----- End of Report -----

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