



# TEST REPORT

1. NO : CT23-020319E
2. Client
  - Name : ALCODAEA CO.,LTD
  - Address : 276, Daecheong-ro, Sanseong-myeon, Eumseong-gun, Chungcheongbuk-do, Republic of Korea
3. Date of Test : 2023.02.22 ~ 2023.05.02
4. Use of Report : Quality control
5. Test Sample : ALUMINIUM EMBO PANEL(4T)
6. Test Method
  - (1) KS F 4737:2019

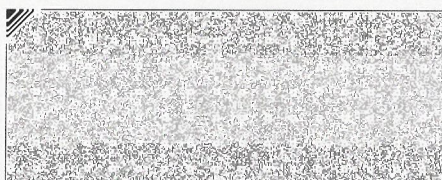
Affirmation	Tested By	Technical Manager
	Name : OH DONGUK <i>duoh</i>	Name : CHOI, Joung Yoon <i>Joung Yoon Choi</i>

This report is not accredited by KOLAS and KS Q ISO/IEC 17025.  
 Our report apply only to the standards or procedures identified and to the sample(s) tested unless otherwise specified. 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. The results of using only a portion of this report cannot be guaranteed. The authenticity of this test report can be checked on KCL website([www.kcl.re.kr](http://www.kcl.re.kr)).

2023.05.02

Korea Conformity Laboratories President Jo, Yung Tae *Jo Yung Tae*

Result Inquiry : 73, Yangcheong 3-gil, 0chang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea (82-43-210-8967)



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## 7. Test Results

Test item	Unit	Test results			Criteria	Test method
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>		
Heat Release Test	Total heat released	MJ/m <sup>2</sup>	0.1	0.2	0.5	(1)
	Duration of consecutive HRR exceeding 200 kW/m <sup>2</sup>	s	0	0	0	
	Penetration of specimen via crack, hole, melting, etc.	-	No	No	No	
Gas Toxicity Test	Average time of laboratory mouse stopped moving	min:s	14:59	14:59	-	A

※ According to 「8.1.7 of KS F ISO 5660-1:2015」, products that are thinner than 6 mm shall be tested by being placed directly above refractory fiber blanket.

※ Test method

(1) KS F 4737:2019

※ Location

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



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■ Heat Release Test Conditions

		Test date	2023. 04. 24.
Heating side of specimen (requested by client)	Heated surface is specified		
Test condition	Temp. (21 ~ 23) °C, Humidity (33 ~ 35) % R.H.		
Test duration (min)	10		
C-factor ( $m^{1/2}g^{1/2}k^{1/2}$ )	0.042 448		
External heat flux (kW/m <sup>2</sup> )	50		
Flow rate of exhaust system (m <sup>3</sup> /s)	0.024		

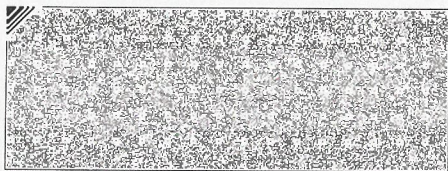
■ Test Specimen Specification

Width (mm)	Specimen 1	98.0	Specimen 2	98.0	Specimen 3	98.1
Length (mm)		98.0		98.0		98.0
Thickness (mm)		4.0		4.0		4.0
Mass (g)		38.8		38.9		38.9
Density (kg/m <sup>3</sup> )		1 010.0		1 012.6		1 011.6
Density of core material (kg/m <sup>3</sup> )		-		-		-
Pretreatment	Temp. (23 ± 2) °C, Humidity (50 ± 5) % R.H.					

■ Test Specimen Configuration(requested by client)

Composition	Material	Manufacturer	Model Name	Thickness
Surface Material	Aluminium Coating Coil			0.6 mm
Core Material	Aluminium Embo Core(Use of AL(0.3 mm))	ALCODOEA CO.,LTD	ALUMINIUM EMBO PANEL	3 mm
Back Material	Aluminium Coil			0.5 mm

Configuration	Photograph



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## ■ Total Heat Release Curve



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## ■ Gas Toxicity Test Results

Test item	Unit	Test results		Test method
		1 <sup>st</sup>	2 <sup>nd</sup>	
Average time of laboratory mouse stopped moving	min:s	14:59	14:59	(1)

Test date

2023. 04. 04.

## ■ Gas Toxicity Test Conditions

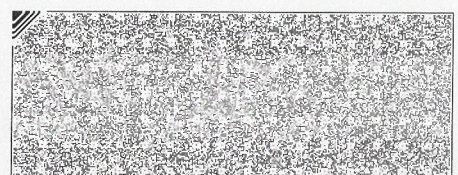
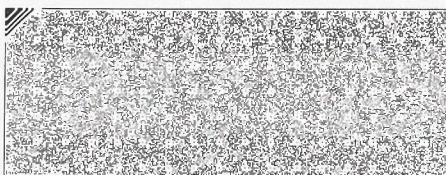
Heating condition	The heating time is a total 6 minutes. Heat up with the auxiliary heat source first. 3 minutes later, additionally heat up with the main heat source while maintaining the auxiliary heat. The heating completes after 6 minutes. (Auxiliary heat source heating time: 6 minutes, main heat source heating time: 3 minutes)				
Heating side of specimen (requested by client)	Heated surface is specified				
Test condition	Temp. (22 ~ 26) °C, Humidity (30 ~ 34) % R.H.				
Test duration (min)	15				
Laboratory mouse	Type	ICR group female	Age	5 weeks	Weight (18 ~ 22) g

## ■ Test Specimen Specification

	Specimen 1	Specimen 2
Width (mm)	217.1	217.5
Length (mm)	217.2	217.0
Thickness (mm)	4.1	4.1
Mass (g)	185.5	185.0
Density (kg/m <sup>3</sup> )	959.5	956.0
Pretreatment	Temp. (23 ± 2) °C, Humidity (50 ± 5) % R.H.	

## ■ Animal Test Report

Committee approval number	IA23-00857
Committee approval date	2023. 03. 31.
Test name	Testing method for gas toxicity of finish materials of buildings



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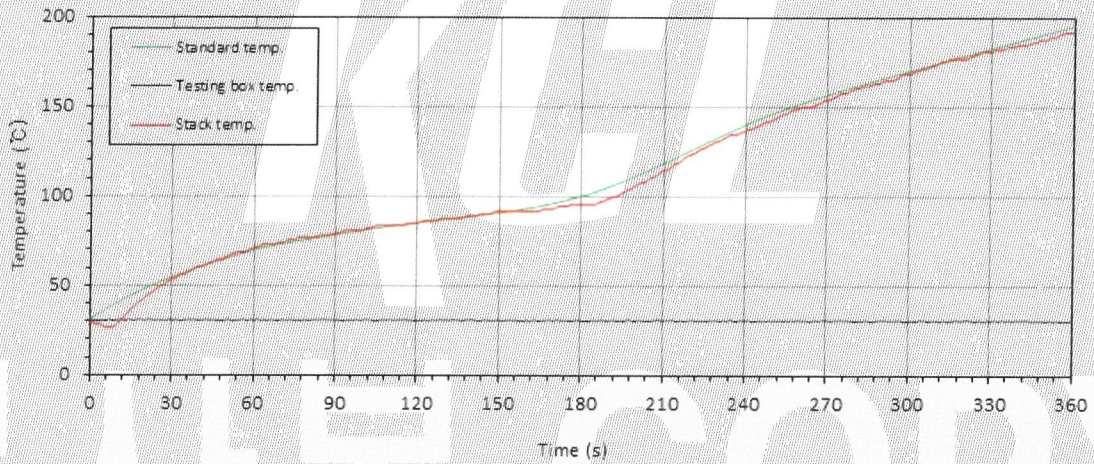
■ Standard Sample Test

- Specimen: Fiber-reinforced calcium silicate board

< Exhaust Temperature >

Elapsed Time (s)	Standard Temp. (°C)	Measured Temp. (°C)	Temp. Deviation (°C)
0.0	30.0	29.9	- 0.1
60.0	70.0	71.7	1.7
120.0	85.0	85.3	0.3
180.0	100.0	96.1	- 3.9
240.0	140.0	138.0	- 2.0
300.0	170.0	169.0	- 1.0
360.0	195.0	192.9	- 2.1

< Exhaust Temperature Curve >



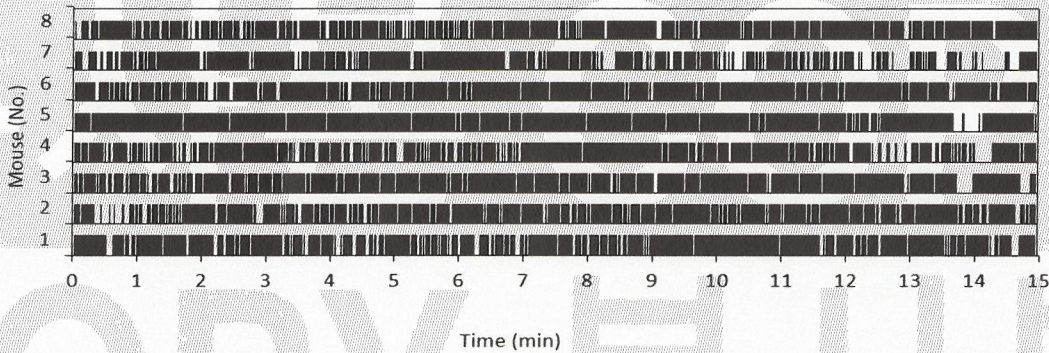
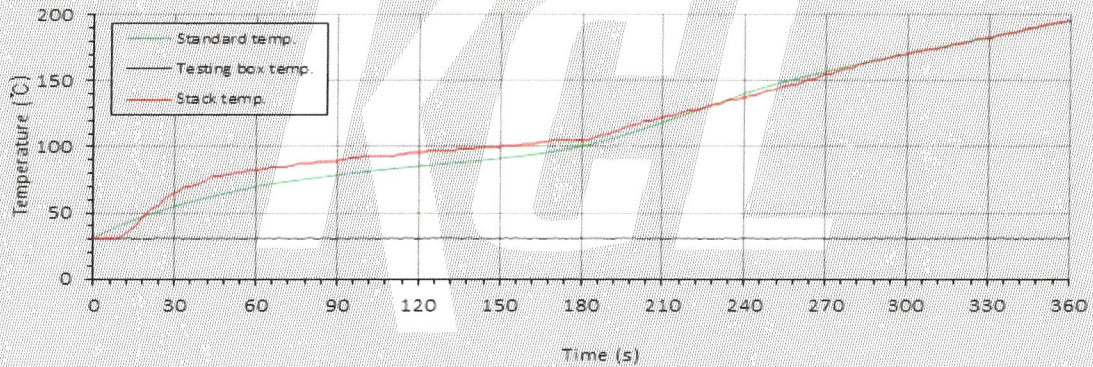
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## ■ Gas Toxicity Test Results (Specimen 1)

Elapsed time (s)	Measured temp. (°C)
0	30.0
60	81.9
120	95.4
180	104.8
240	137.4
300	170.9
360	195.3

Treadmill	Time of stop moving
M1	14 min 59 s
M2	14 min 59 s
M3	14 min 59 s
M4	14 min 59 s
M5	14 min 59 s
M6	14 min 59 s
M7	14 min 59 s
M8	14 min 59 s
Average	14 min 59 s
Standard deviation	00 min 00 s
Average time of stop moving	14 min 59 s



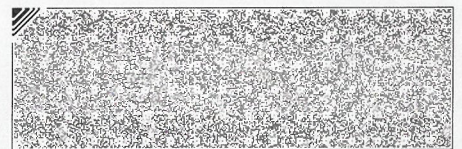
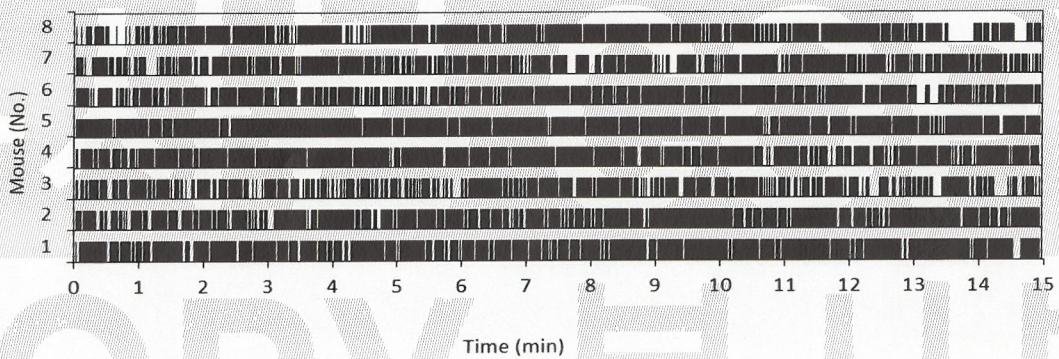
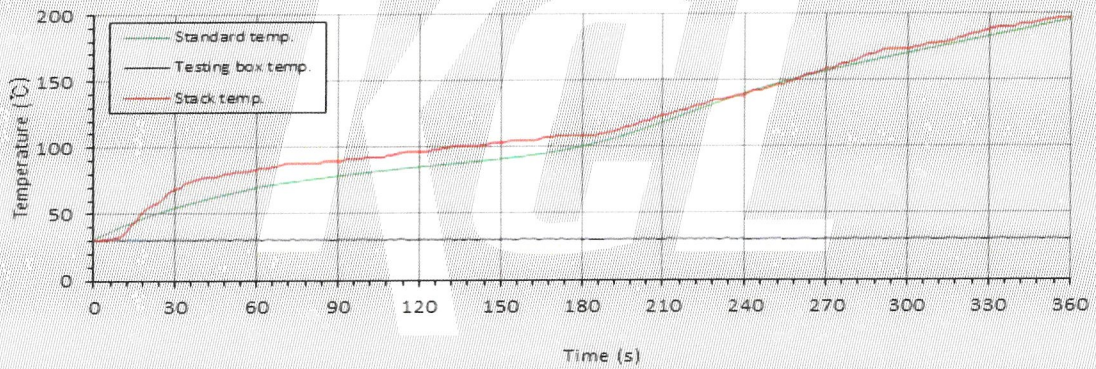
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## ■ Gas Toxicity Test Results (Specimen 2)

Elapsed time (s)	Measured temp. (°C)
0	30.6
60	84.1
120	96.7
180	108.9
240	139.6
300	173.7
360	196.6

Treadmill	Time of stop moving
M1	14 min 59 s
M2	14 min 59 s
M3	14 min 59 s
M4	14 min 58 s
M5	14 min 59 s
M6	14 min 59 s
M7	14 min 59 s
M8	14 min 59 s
Average	14 min 59 s
Standard deviation	00 min 00 s
Average time of stop moving	14 min 59 s



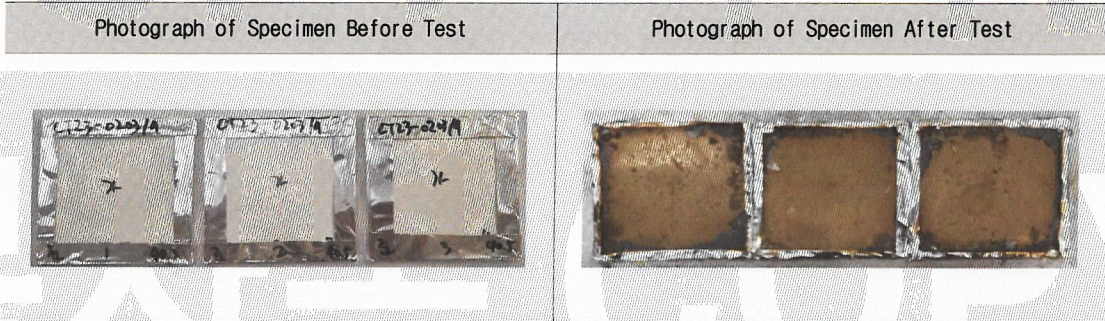


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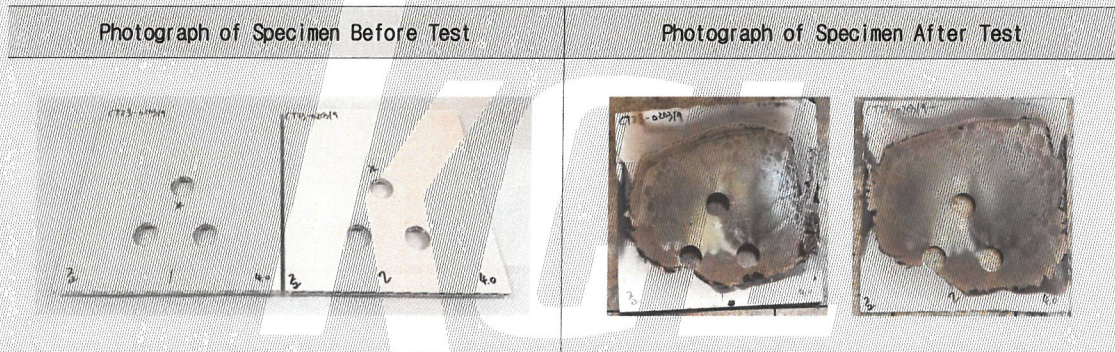
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■ Photograph of Specimen Before/After Test

< Heat release test >



< Gas toxicity test >



—— End of Report ——

