



TEST REPORT

No. : CT22-048926E

1. Client

Name : Dongkuk Steel

Address : 102, Sinseon-ro, Nam-gu, Busan, South Korea

Date of Receipt : 2022.05.18

2. Specimen

Specimen Name : Pre-Coated Metal

Model Name : Steel sheet, 55% Aluminium-Zinc Alloy-Coated by the Hot-Dip Process

Product Number : E4SA22C

3. Test Standard : MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84

4. Use of Report : Quality Control

5. Test Period : 2022.05.18 ~ 2022.06.28

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 24, Subparagraph 1, on Heat release rate(concalorimeter method) test

The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 24, Subparagraph 2, on Gas-toxicity test

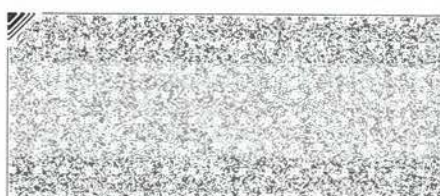
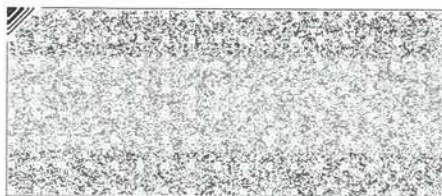
Confirmation	Tested by	Technical Officer	
	Name OH DONGUK duoh	Name	

Issue Date : 2022.06.28

Korea Conformity Laboratories

President Jo, Yung Tae

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



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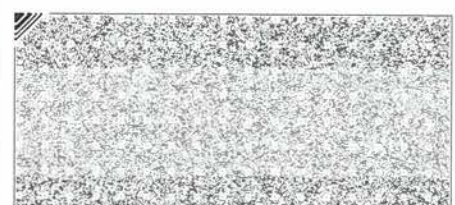
7. Test Results

Test item		Unit	Test results			Criteria	Test method	Location
			1 st	2 nd	3 rd			
Heat Release Test	Total heat released	MJ/m ²	0.4	0.2	0.1	Below 8	(2)	A
	Duration of consecutive HRR exceeding 200 kW/m ²	s	0	0	0	Under 10		
	Occurrence(Y/N) of hazard when setting fire on the specimen	-	No	No	No	Non		
Gas Toxicity Test	Average time of laboratory mouse stopped moving	min:sec	14:57	15:00	-	Over 9:00	(1)	

- ※ The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 24, Subparagraph 1, on Heat release rate(cone calorimeter method) test
- ※ The tested specimen complies with the criteria stipulated in MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84, Article 24, 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.
- ※ 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) Article 24, Subparagraph 2 of the MOLIT(Ministry of Land, Infrastructure and Transport) Notification No. 2022-84
 - (2) Article 24, Subparagraph 1 of the 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

This report is not accredited by KOLAS.

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).



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Heat Release Test Conditions

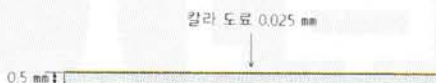
		Test date	Jun. 27, 2022
Heating side of specimen (requested by client)	Heated surface is specified		
Test condition	Temp. (27.9 ~ 28.0) °C, Humidity (60 ~ 61) % R.H.		
Test duration (min)	10		
C-factor ($m^{1/2} \cdot g^{1/2} \cdot K^{1/2}$)	0.040 690		
External heat flux (kW/m ²)	50		
Flow rate of exhaust system (m ³ /s)	0.024		

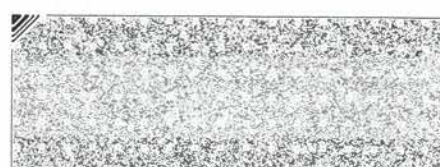
Test Specimen Specification

Width (mm)	99.4	99.5	99.4
Length (mm)	100.9	100.8	100.0
Thickness (mm)	0.5	0.5	0.5
Mass (g)	Specimen 1 39.8	Specimen 2 39.7	Specimen 3 39.5
Density (kg/m ³)	7 936.6	7 916.6	7 947.7
Density of core material (kg/m ³)	-	-	-
Pretreatment	Temp. (23 ± 2) °C, Humidity (50 ± 5) % R.H.		

Test Specimen Specification

Composition	Material	Manufacturer	Model Name	Thickness
Paint	Color Paint	Dongkuk Steel	-	0.025 mm
Base metal	Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process	Dongkuk Steel	-	0.5 mm

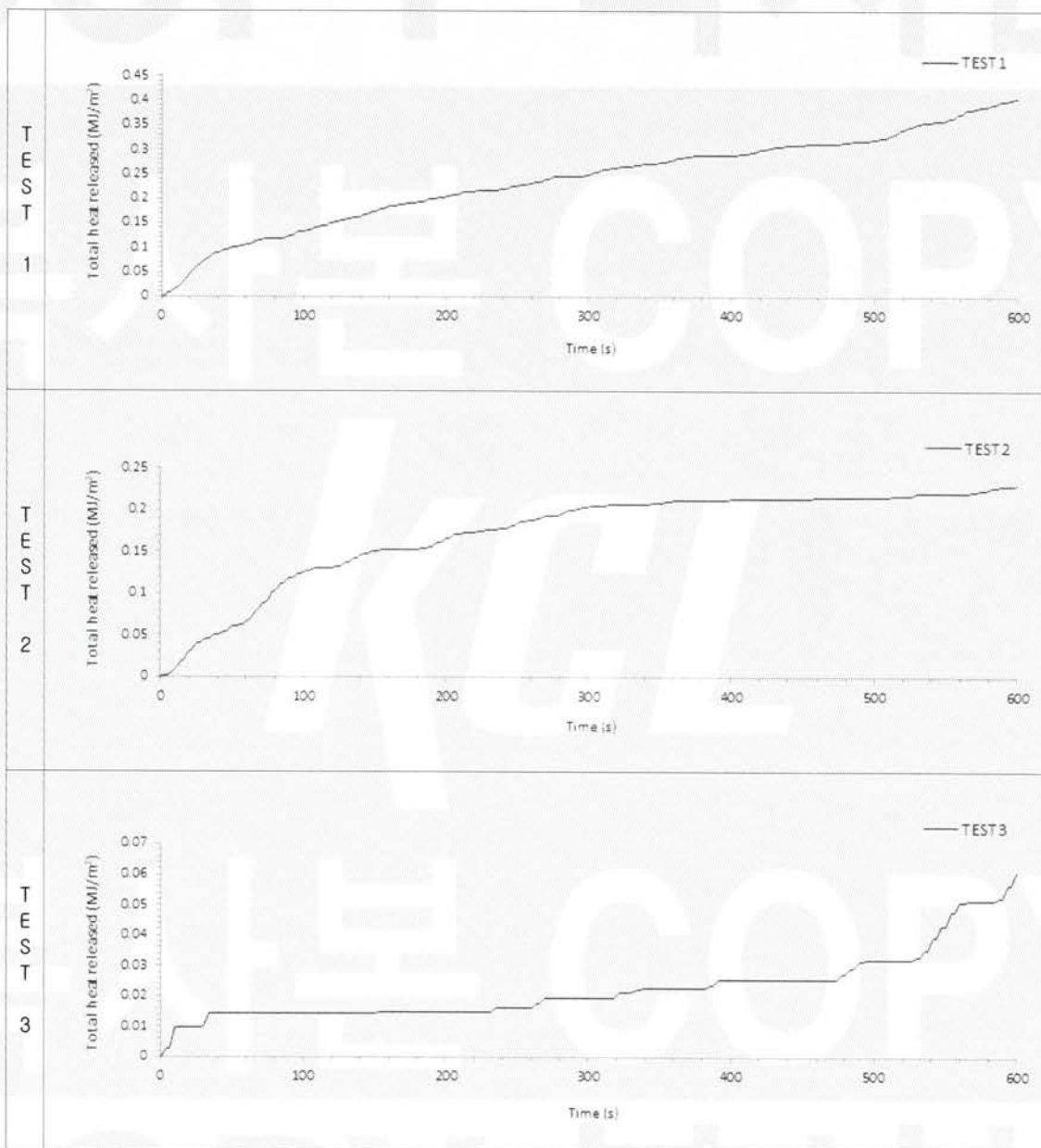
Configuration	Photograph
	



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■ Total Heat Release Curve



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■ Gas Toxicity Test Results

		Test date		May. 27, 2022
Test item	Unit	Test results		Test method
		1 st	2 nd	
Average time of laboratory mouse stopped moving	min:sec	14:57	15:00	(1)

■ 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 side of specimen (requested by client)	Heated surface is specified				
Test condition	Temp. (25.6 ~ 26.0) °C, Humidity (50 ~ 51) % R.H.				
Test duration (min)	15				
Laboratory mouse	Type	ICR group female	Age	5 weeks	Weight (18 ~ 22) g

■ Test Specimen Specification

Width (mm)	Specimen 1	218.3	Specimen 2	218.3
Length (mm)		218.0		217.4
Thickness (mm)		0.5		0.5
Mass (g)		188.1		188.4
Density (kg/m³)		7 905.1		7 939.6
Pretreatment	Temp. (23 ± 2) °C, Humidity (50 ± 5) % R.H.			



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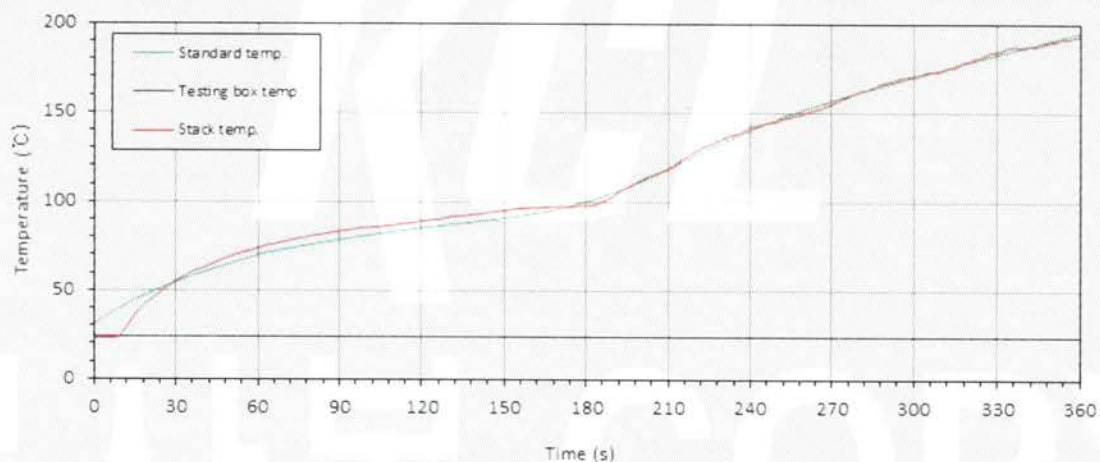
■ Standard Sample Test

- Specimen: Fiber-reinforced calcium silicate board

< Exhaust Temperature >

경과 시간 (s)	표준 온도 (℃)	측정 온도 (℃)	온도 편차 (℃)
0.0	30.0	23.3	-6.7
60.0	70.0	74.0	4.0
120.0	85.0	89.1	4.1
180.0	100.0	98.2	-1.8
240.0	140.0	142.2	2.2
300.0	170.0	170.9	0.9
360.0	195.0	193.5	-1.5

< Exhaust Temperature Curve >



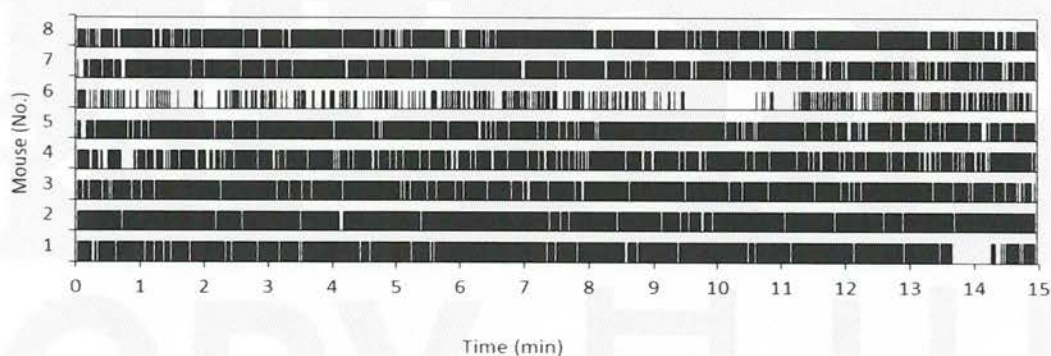
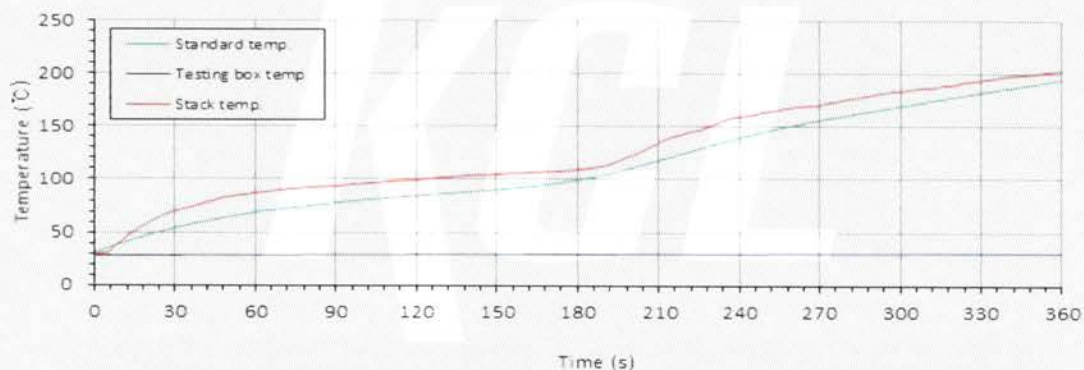
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■ Gas Toxicity Test Results (Specimen 1)

Elapsed time (s)	Measured temp. (°C)
0	28.9
60	86.4
120	99.4
180	109.2
240	160.0
300	184.4
360	203.8

Treadmill	Time of stop moving
M1	15 min 00 s
M2	15 min 00 s
M3	15 min 00 s
M4	14 min 59 s
M5	15 min 00 s
M6	14 min 55 s
M7	15 min 00 s
M8	14 min 59 s
Average	14 min 59 s
Standard deviation	00 min 02 s
Average time of stop moving	14 min 57 s



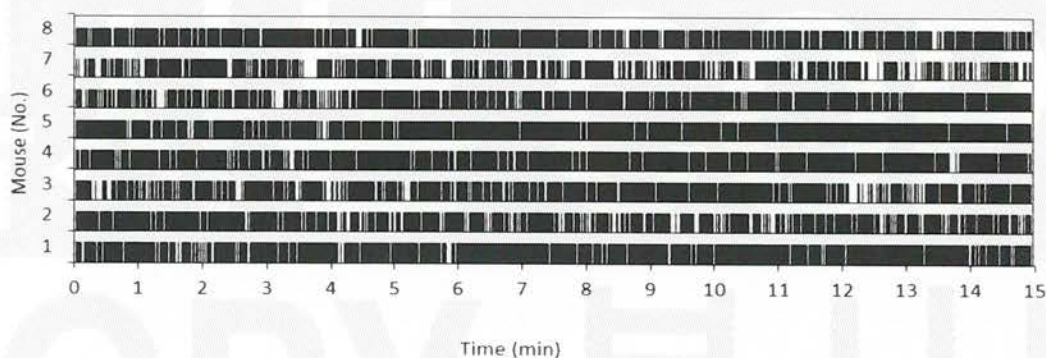
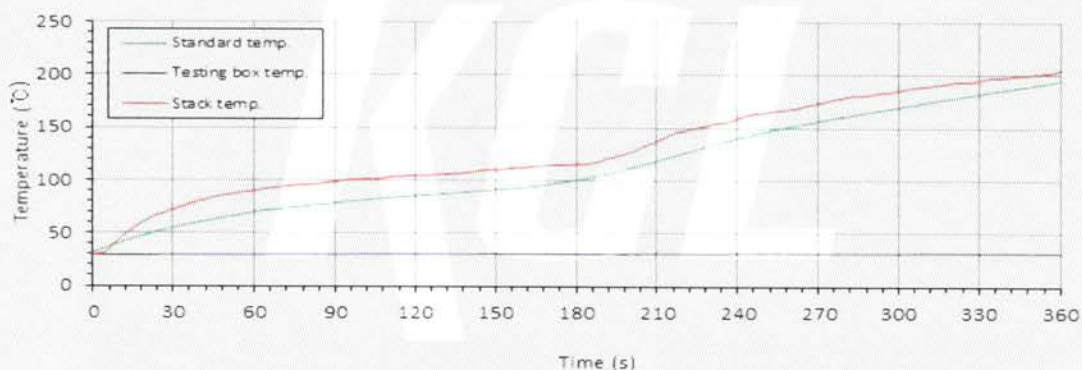
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■ Gas Toxicity Test Results (Specimen 2)

Elapsed time (s)	Measured temp. (°C)
0	29.2
60	89.5
120	104.5
180	115.1
240	158.9
300	185.3
360	204.4

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	15 min 00 s
M7	15 min 00 s
M8	14 min 59 s
Average	15 min 00 s
Standard deviation	00 min 00 s
Average time of stop moving	15 min 00 s

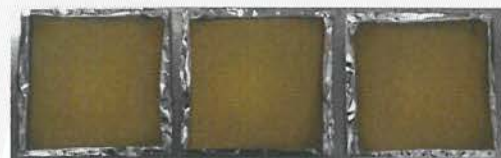


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■ Photograph of Specimen Before/After Test

< Heat release test >

Photograph of Specimen Before Test	Photograph of Specimen After Test
	

< Gas toxicity test >

Photograph of Specimen Before Test	Photograph of Specimen After Test
	

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

