



TEST REPORT

Test Report



68, Gajaeul-ro, Seo-gu, Incheon, 22829, Korea TEL 82-41-589-0010 FAX 82-41-589-0012	Report No. : THF-2023-000025 1 / 9
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1. Applicant

- Company Name : Saint-Gobain Isover Korea Co.,Ltd
- Address : IF, 70, Bugokgongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Republic of Korea
- Date of receipt : 20230106

2. Test target product

- Sample Name : E.SAVER(aluminum)
- Applied Range : Interior Finishing Materials
- Product No. : E.SAVER(aluminum)_211228

3. Test Standard : Ministry of Land, Infrastructure and Transport Notice No. 2022-84(2022) 'Quality recognition and management standards for building materials, etc.'

4. Purpose of the report : QUALITY CONTROL

5. Test period : 2023. 01. 06. ~ 2023. 03. 09.

6. Test Environment : Temperature : (15~30) °C, humidity : (20~80) % R.H.

7. Test Results : Suitable with test results according to Ministry of Land, Infrastructure and Transport Notice No. 2022-84 'Quality recognition and management standards for building materials, etc.' Article 24 Subparagraphs 1 and 2

- ①. The test results of this test report are only limited in to the samples and sample names provided by the client and do not guarantee the quality of all products of the client. You can check website (www.ktr.or.kr) or QR code to verify the authenticity of the certificate.
- ②. This test report shall be used only within the purpose of its defined usage and shall not be used for public relation, advertisement and lawsuit.
- ③. This test report is only valid when printed on KTR original report paper with hologram and when re-issued by KTR.

Confirm	Prepared by	Technical Manager
	Name : Park Sanghyo <i>Park Sanghyo</i>	Name : Lee Seong-gyu <i>Lee Seong-gyu</i>

Issue Date : 2023. 03. 09.

Korea Testing & Research Institute

President *Kim Hyun cheol*



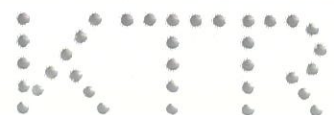
QR Code to verify genuineness

* Test reports are valid for 3 year from the date of issuance of the report.

8. Test Results

Division	Test Item	Unit	Test Results			Criteria	Test Method	Test Site
			1st	2st	3st			
Interior Finishing materials	Total Heat Release	MJ/m ²	0.2	0.2	1.0	8 MJ/m ² or below	(1)	A
	Heat Release Rate(HRR) time over 200 kW/m ²	s	0	0	0	10 s below		
	Whole melting of core material or any cracking or hole that penetration to the rear side	-	not be observed	not be observed	not be observed	should not be observed		
	Gas Hazard Test	Average deed stopping time	min:s	14:44	14:50	-		

- * Performance test was done according to the Article 24, (1) and (2) of the 「Ministry of Land, Transport and Maritime Affairs, Notification No. 2022-84」.(Client provided)
- * Suitable to the heat release rate (cone calorimeter method) test result according to Article 24, (1) of 「Notice No. 2022-84 of the Ministry of Land, Infrastructure and Transport」.
- * Suitable to gas hazard test results according to Article 24, (2) of 「Notification No. 2022-84 of the Ministry of Land, Infrastructure and Transport」.
- * Test reports are valid for three years from the date of issuance of the report according to the Article 29, (4) of the 「Ministry of Land, Transport and Maritime Affairs, Notification No. 2022-84」.
- * Test Method
 - (1) 「Ministry of Land, Infrastructure and Transport Notice No. 2022-84」
- * Test site A. Korea Testing & Research Institute Building C, 68, Gajaeul-ro, Seo-gu, Incheon, Republic of Korea
- * Quasi-noncombustible materials performance criteria in the Article 24(1) and (2) of the 「Ministry of Land, Transport and Maritime Affairs, Notification No. 2022-84」.
 - 1) The total heat release should be 8MJ/m² or below for 10 minutes after the heating start.
 - 2) The maximum heat release rate for 10 minutes shall not exceed 200 kW/m² in a row for than 10 seconds or more.
 - 3) After heating for 10 minutes, there should be not observe harmful cracks(a deformation in which the test object splits and the floor is visible), holes(a deformation in which the bottom surface is visible from the surface of the test object), and melting(a case where the test object melts and the floor is visible) penetrating the test specimen. There should not be partial melting or contraction exceed 20% of the thickness of the test specimen.
 - 4) The average time of suspension of behavior in experimental mice should be more than 9 minutes.



■ Test conditions for Heat release rate

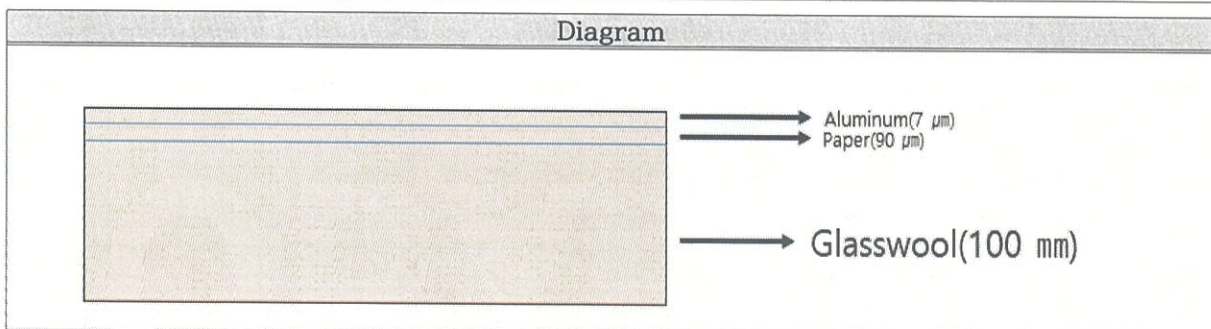
	Date of Test	2023. 03. 07.
Burning surface	Separate display of Burning surface	
Testing Environment	Temperature (23 ± 2) °C, Relative Humidity (50 ± 5) % R.H.	
Test Time (min)	10	
Orifice constant C (m ^{1/2} .g ^{1/2} .K ^{1/2})	0.043 66	
Heat Flux (kW/m²)	50 ± 1	
Exhaust system flow (m ² /s)	0.024 ± 0.002	

■ Heat release rate test conditions

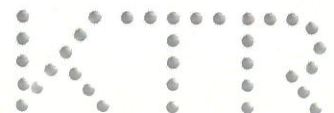
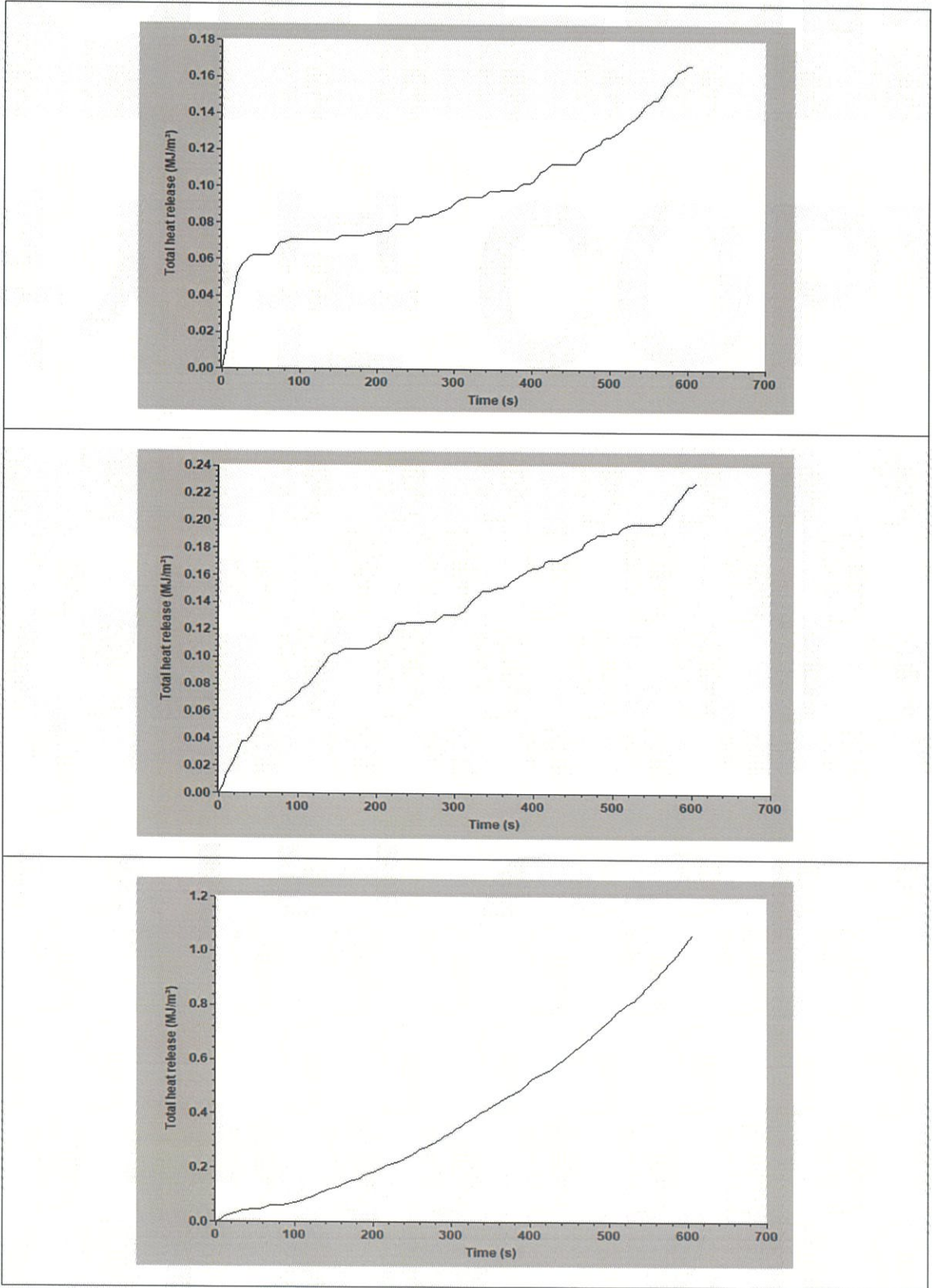
Width (mm)	No. 1	99.2	No. 2	99.5	No. 3	99.4
Length (mm)		99.8		99.7		99.8
Thickness (mm)		49.4		49.7		49.9
Mass (g)		24.8		26.3		25.0
Total density (kg/m³)		39.6		38.2		38.8
Core density (kg/m³)		-		-		-
Pretreatment	Temperature (23 ± 2) °C, Relative Humidity (50 ± 5) % R.H.					

■ Composition of specimen

Composition	Quality of the material	Manufacturer	Model	Thickness (mm)
Aluminum (Burning surface)	Aluminum	DONG WON	aluminum	7 μm
Paper	Paper			90 μm
Insulation	Glasswool	Isover korea	E.saver	100 mm



■ Heat release rate Test Temperature Graph(Total heat release)



■ Gas Hazard test result

Test Items	Unit	Test result		Test Method
		No. 1	No. 2	
Average deed stopping time of Test Mouse	min:s	14:44	14:50	(1)

■ Gas Hazard Test Conditions

Heating Condition	After heating for 6 minutes with auxiliary heat source (LPG), heat again for 3 minutes with main heat source (electric heat)				
Burning surface (Client provided)	Separate display of Burning surface				
Testing Environment	Temperature (23 ± 2) °C, Relative Humidity (50 ± 5) % R.H.				
Test Time (min)	15				
Test Mouse	Line	ICR, Female	Age	5	Weight (18 ~ 22) g

■ Gas Hazard Test Specimen Conditions

Width (mm)	No. 1	218.0	No. 2	218.0
Length (mm)		217.8		218.9
Thickness (mm)		100.0		101.1
Mass (g)		150.8		163.9
Total density (kg/m ³)		37.2		36.6
Pretreatment	Temperature (23 ± 2) °C, Relative Humidity (50 ± 5) % R.H.			

■ Report on the end of animal testing

Committee approval number	IAC2023-0503
Committee approval date	2023-02-21

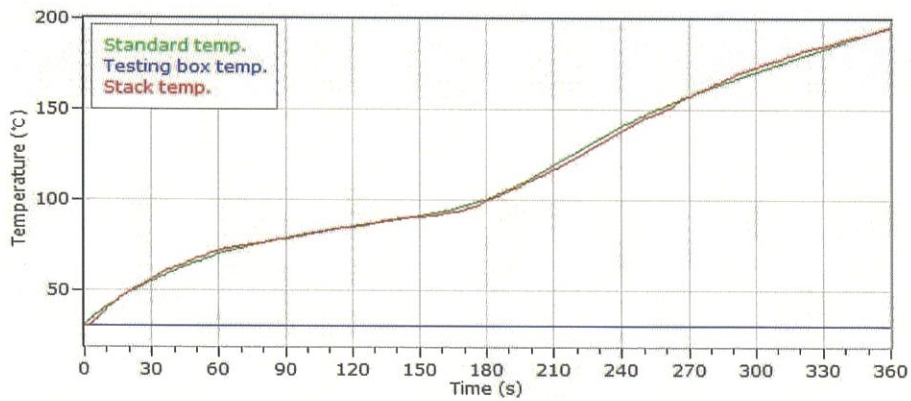
■ Standard Form Test

- Standard Form : Fiber Reinforced Calcium Silicate Board

< Exhaust Temperature >

Elapsed Time (s)	Standard Temperature (°C)	Measure Temperature (°C)	Temperature range (°C)
0.0	30	29.9	-0.1
60.0	70	71.6	1.6
120.0	85	84.5	-0.5
180.0	100	99.3	-0.7
240.0	140	137.5	-2.5
300.0	170	172.5	2.5
360.0	195	194.4	-0.6

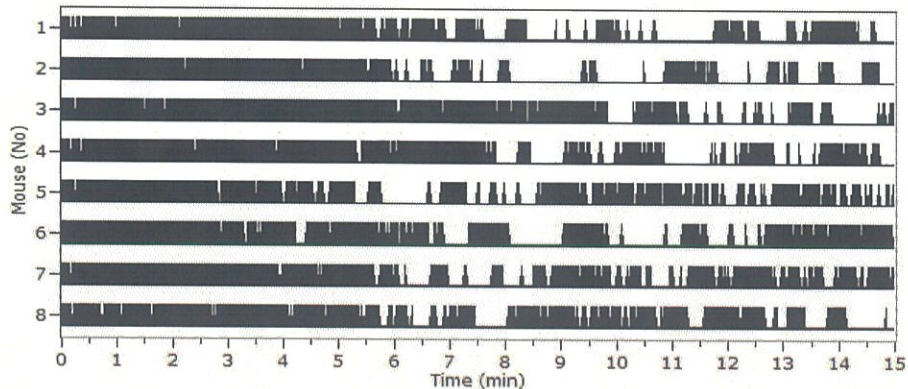
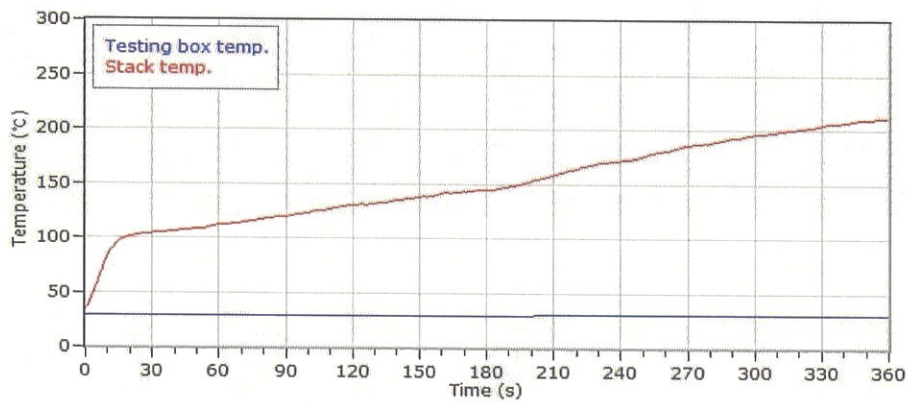
< Exhaust Temperature Curve >



■ Hazardous gas test result(No. 1)

Elapsed Time (s)	Measure Temperature (°C)
0	33.4
60	111.3
120	129.7
180	143.7
240	170.8
300	195.3
360	210.7

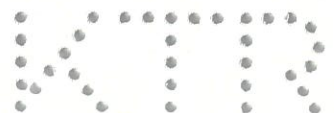
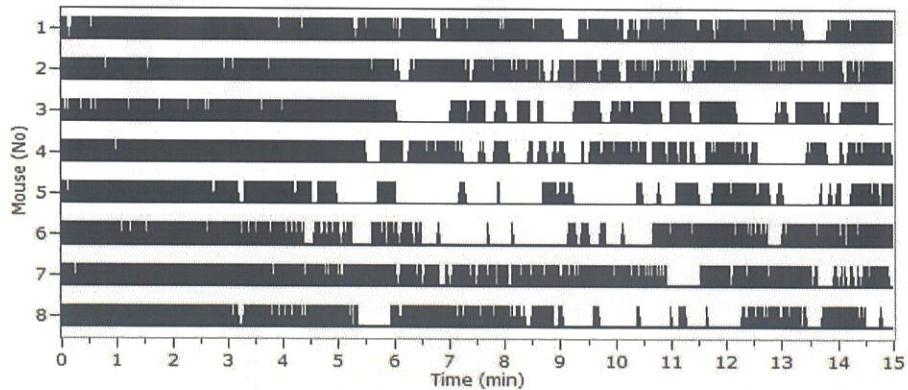
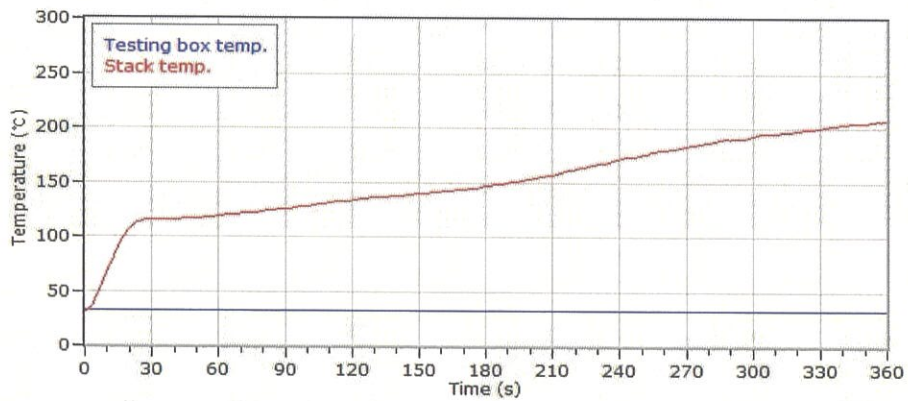
Spinning box	Stop time
M1	14 min 39 s
M2	14 min 43 s
M3	15 min 00 s
M4	14 min 44 s
M5	15 min 00 s
M6	15 min 00 s
M7	15 min 00 s
M8	14 min 51 s
Average	14 min 52 s
Standard deviation	00 min 08 s
Average deed stopping time	14 min 44 s



■ Hazardous gas test result(No. 2)

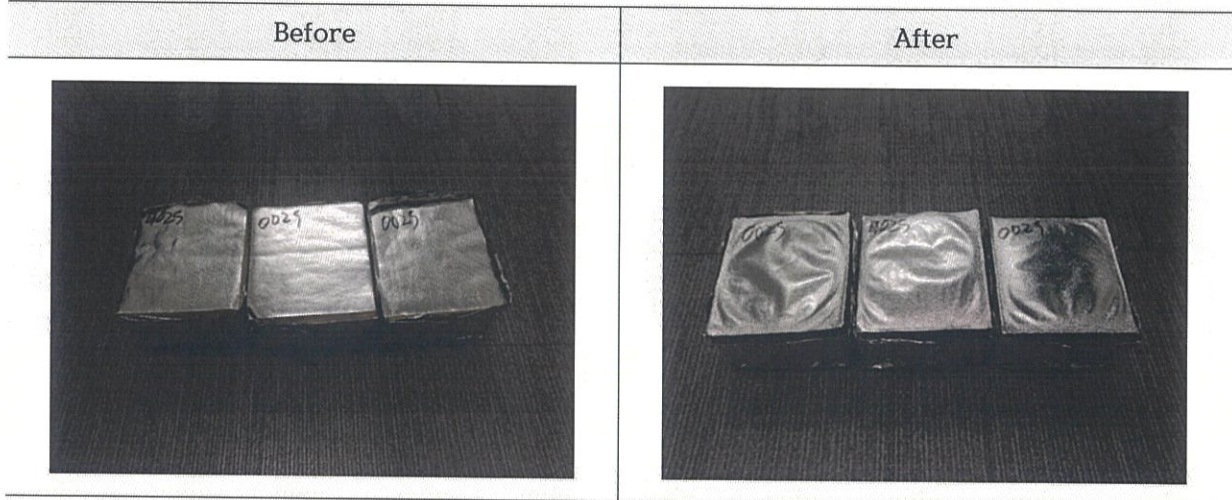
Elapsed Time (s)	Measure Temperature (°C)
0	30.9
60	118.2
120	132.3
180	145.9
240	170.4
300	191.8
360	206.0

Spinning box	Stop time
M1	15 min 00 s
M2	15 min 00 s
M3	14 min 43 s
M4	14 min 58 s
M5	15 min 00 s
M6	15 min 00 s
M7	15 min 00 s
M8	14 min 47 s
Average	14 min 56 s
Standard deviation	00 min 06 s
Average deed stopping time	14 min 50 s

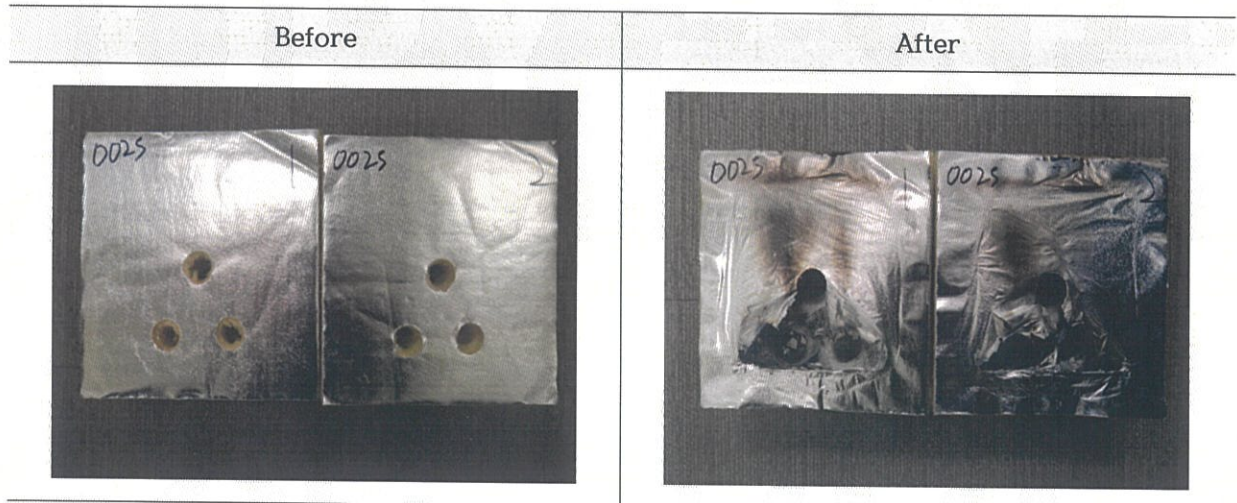


■ Test sample picture

< Heat release rate test >



< Gas Hazard Test >



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