



TEST REPORT



1. NO : CT18-069868

2. Client

○ Name : Dongkuk Steel

○ Address : 102, Sinseon-ro, Nam-gu, Busan, Republic of Korea

3. Date of Test : 2018.06.21 ~ 2018.07.23

4. Use of Report : Quality Control

5. Test Sample : Pre Painted Steel

6. Test Method

(1) KS F 2271:2016

(2) KS F ISO 5660-1:2008

Reissuance(R1)

Date : 2018.07.23

Affirmation	Tested By	Technical Manager
	Name : OH DONG-UK <i>duoh</i>	Name : Cho Jae Woo <i>CHO, JAE, WOO</i>

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 qualities of the lot from which the sample was taken or of apparently identical or similar products.

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2018.07.23

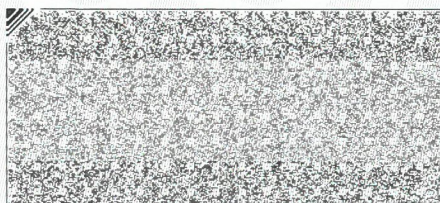
Korea Conformity Laboratories President Yoon Kap Seok

Yoon, KapSeok

Accredited by KOLAS, Republic of KOREA

Address : 28115 73, Yangcheong 3-gil, Ochang-eup, Cheongwon-Gu, Cheongju-Si, Chungbuk, Korea 82-43-718-9005

Result Inquiry : Fire & Safety Evaluation Technology Center 82-43-210-8967



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Test Results

Items			Results			Criteria	Testing Methods
			1	2	3		
√	Heat release test	Total heat released (MJ/m ²)	0.5	0.7	0.3	≤ 8 MJ/m ²	KS F ISO 5660-1 : 2008
		Duration of consecutive HRR over 200 kW/m ² (s)	0	0	0	≤ 10 seconds	
		Crack, hole or melting through the specimen (Yes/No)	No	No	No	No	
√	Gas toxicity test	Time to incapability of moving (min : s)	14:36	14:40	-	≥ 9 minutes	KS F 2271 : 2016

“√” The display items are recognized in the item received KOLAS of KCL.

※ Suitable for quasi-noncombustible material criteria of Ministry of Land, Infrastructure and Transport, Notification No.: 2015-744

※ Description of specimen(Provided by the client) :

Painting(0.025 mm) + Steel(0.5 mm)

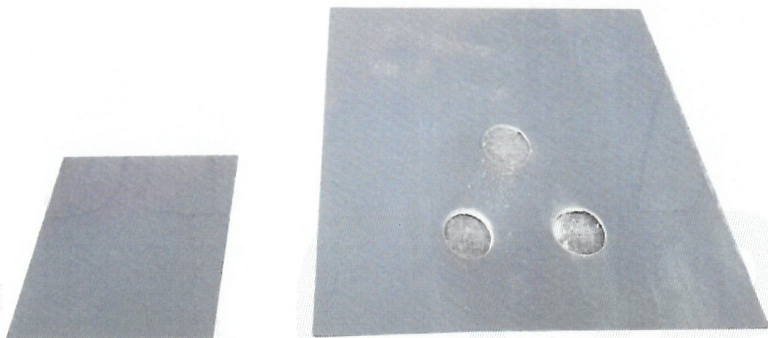


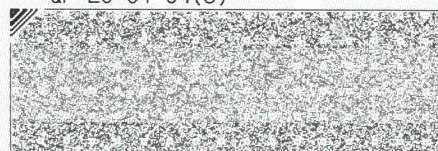
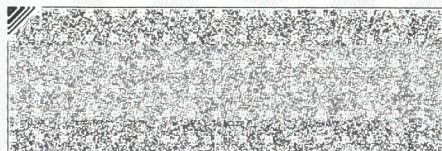
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Specimen and test condition

Items	Heat release test					
Thickness (mm)	TEST 1 :	0.6	TEST 2 :	0.6	TEST 3 :	0.5
Weight (g)	TEST 1 :	14.2	TEST 2 :	14.2	TEST 3 :	14.2
Density of the specimen (kg/m³)	TEST 1 :	2402.6	TEST 2 :	2395.4	TEST 3 :	2900.6
Density of the core material (kg/m³)	-					
Exposed face of the specimen	Coated sides					
External heat flux (kW/m²)	50					
Flow rate of the exhaust system (m³/s)	0.024					
Test duration (min)	10					
Number of test specimens	3					
Preparation environment	Temp. (23 ± 2) °C, R.H. (50 ± 5) % (ISO 554)					
C-factor (m ^{1/2} · g ^{1/2} · K ^{1/2})	0.044 311					
						
Items	Gas toxicity test					
Test duration (min)	15					
Mouse	ICR group female					
Average weight of the mouse(g)	① 19 ② 19					

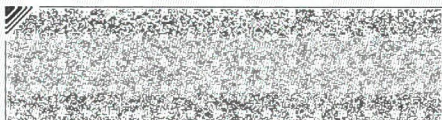
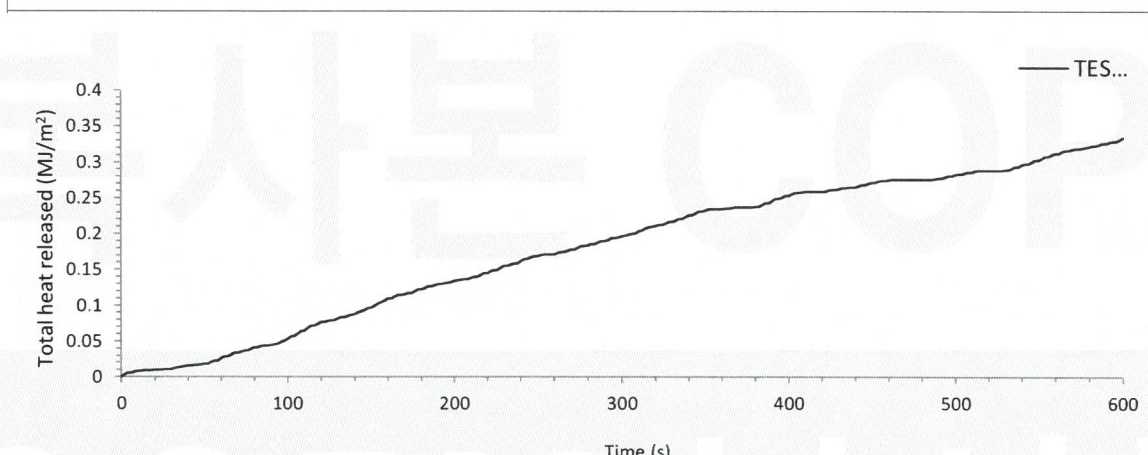
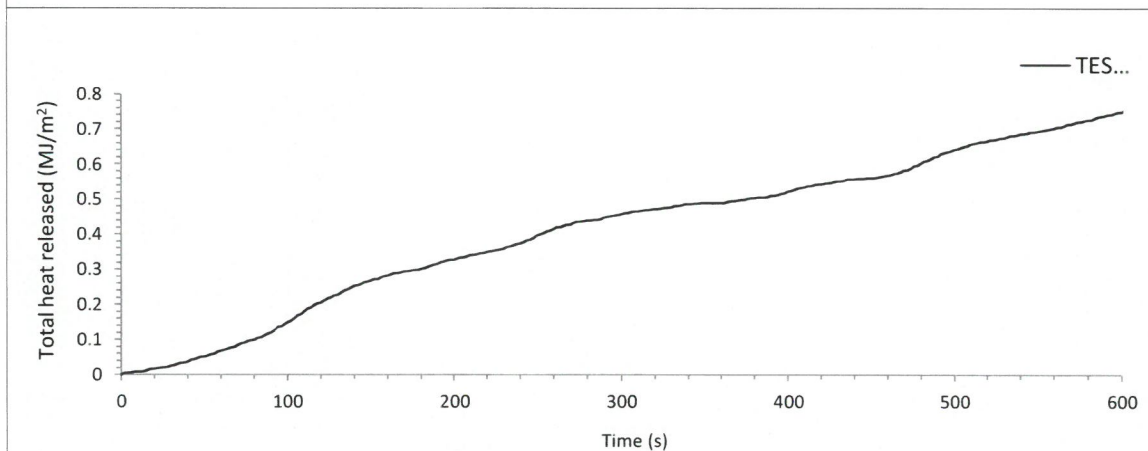
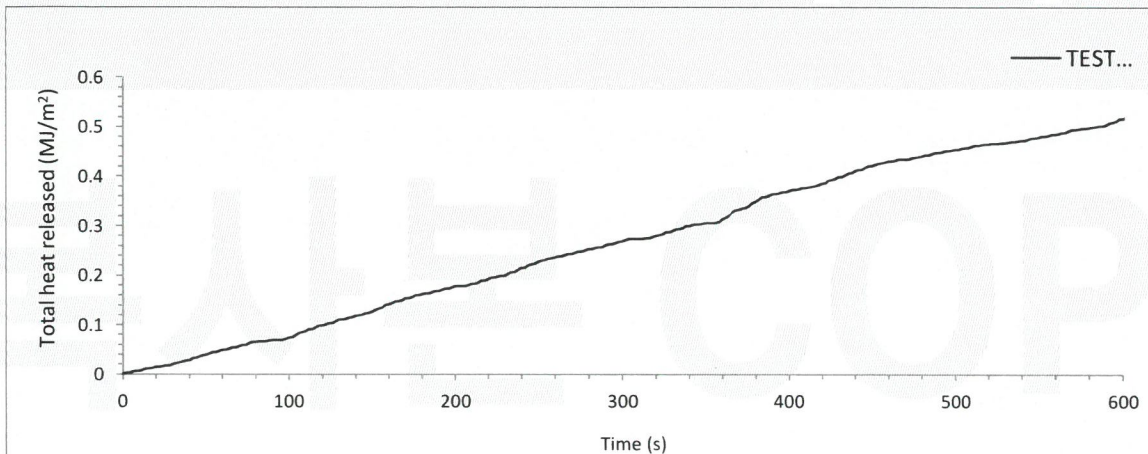


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Total heat released



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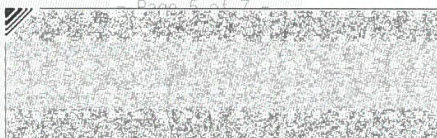
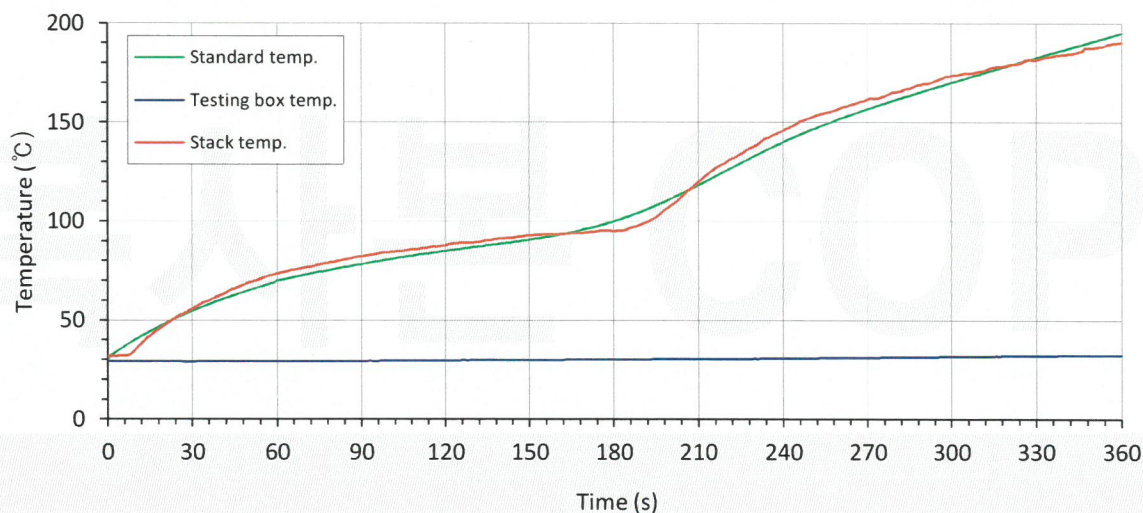
Gas toxicity test result

No	Stock	Sex	Average weight (g)	Time to incapability of moving
No. 1	ICR	Female	19	14 min 36 s
No. 2	ICR	Female	19	14 min 40 s

<Gas temperature>

Time (s)	Standard Temp. (°C)	Measured Temp. (°C)	Temp. deviation (°C)
0.0	30.0	31.8	1.8
60.0	70.0	73.6	3.6
120.0	85.0	87.7	2.7
180.0	100.0	95.0	-5.0
240.0	140.0	145.8	5.8
300.0	170.0	173.4	3.4
360.0	195.0	190.2	-4.8

<Gas temperature graph>



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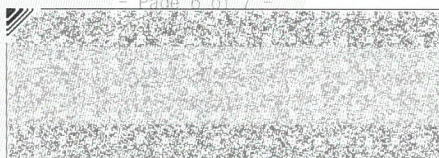
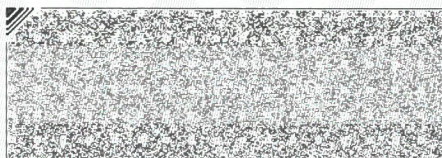
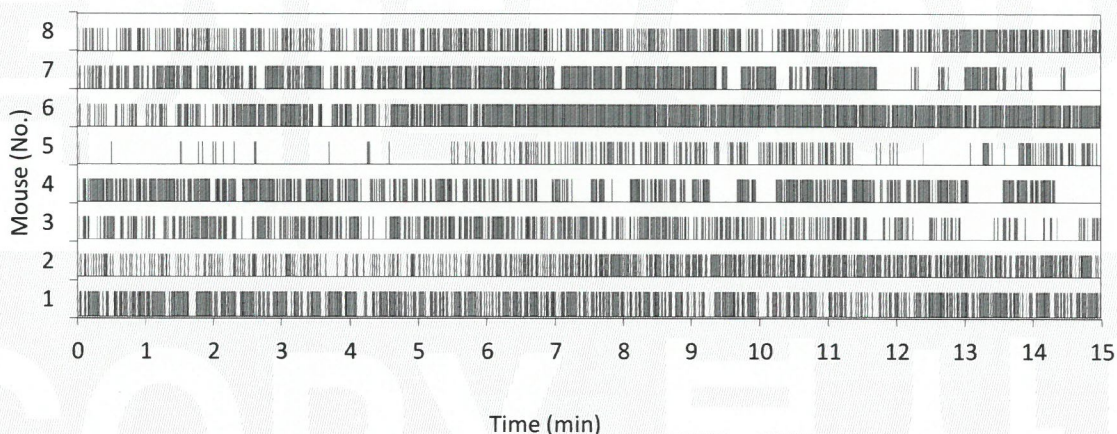
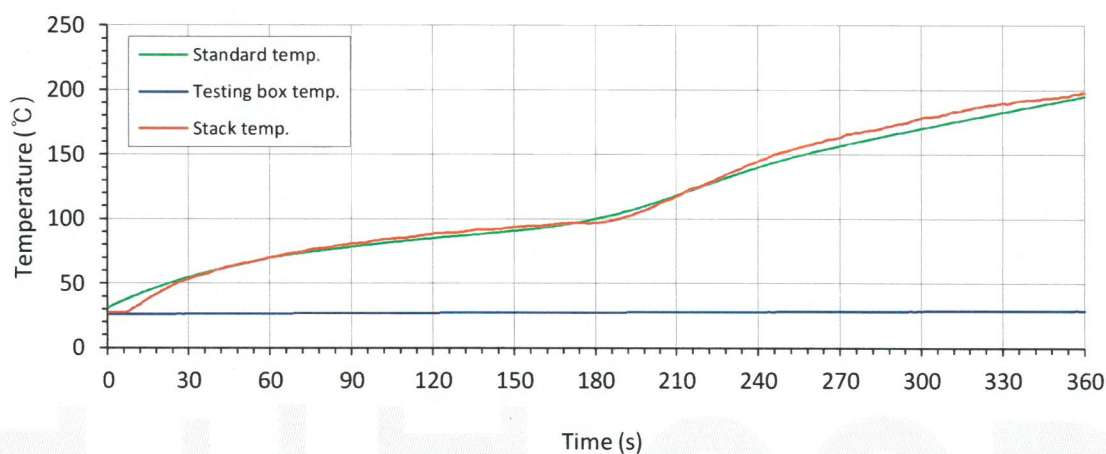


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Test No : No. 1

Time (s)	Box temp. (°C)	Gas temp. (°C)
0.0	30.0	27.4
60.0	30.0	69.9
120.0	30.0	88.5
180.0	30.0	96.9
240.0	30.0	144.5
300.0	30.0	178.2
360.0	30.0	197.8

No. of mice	Time to incapability
M1	15 min 00 s
M2	14 min 58 s
M3	15 min 00 s
M4	14 min 20 s
M5	14 min 57 s
M6	15 min 00 s
M7	14 min 29 s
M8	15 min 00 s
Average	14 min 51 s
Standard deviation	00 min 15 s
Test result	14 min 36 s



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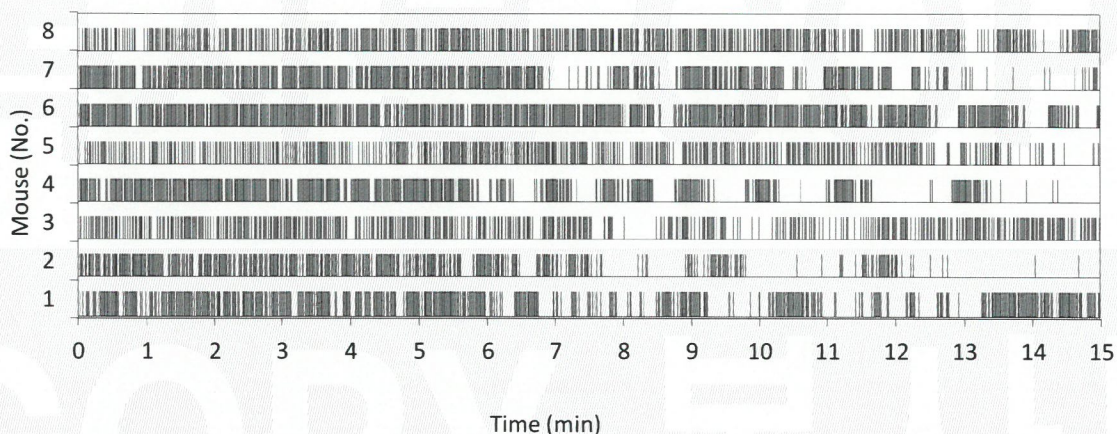
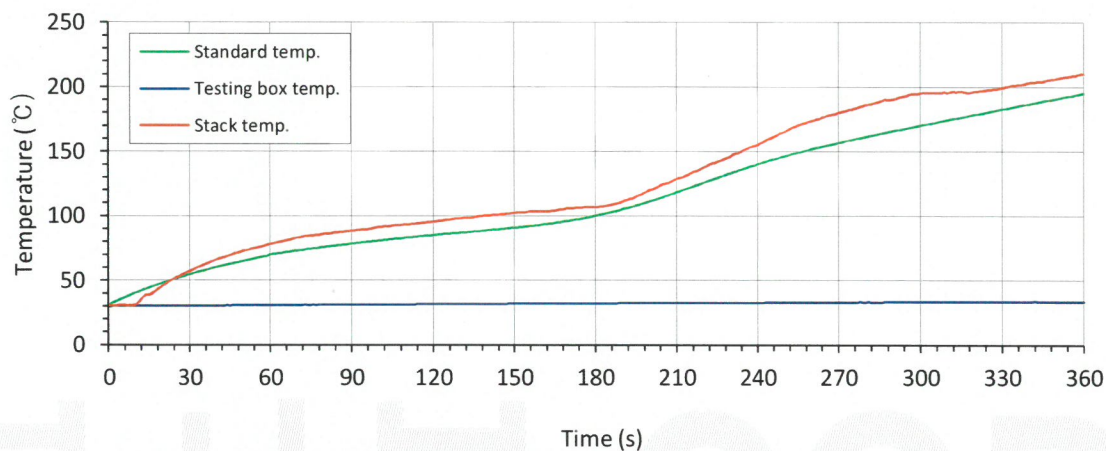


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Test No : No. 2

Time (s)	Box temp. (°C)	Gas temp. (°C)
0.0	30.0	30.2
60.0	30.6	78.1
120.0	31.4	95.3
180.0	32.2	106.6
240.0	32.7	155.1
300.0	33.3	194.9
360.0	33.6	210.1

No. of mice	Time to incapability
M1	15 min 00 s
M2	14 min 41 s
M3	15 min 00 s
M4	14 min 23 s
M5	14 min 59 s
M6	15 min 00 s
M7	14 min 58 s
M8	15 min 00 s
Average	14 min 53 s
Standard deviation	00 min 13 s
Test result	14 min 40 s



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

