



TEST REPORT



1. NO : CT18-098281

2. Client

○ Name : Dongkuk Steel

○ Address : 102, Sinseon-ro, Nam-gu, Busan, Republic of Korea, Zip 608-750

3. Date of Test : 2018.09.10 ~ 2018.10.22

4. Use of Report : Quality Control

5. Test Sample : Pre Coated Metal

6. Test Method

(1) KS F 2271:2016

(2) KS F ISO 5660-1:2008

Reissuance(R1)

Date : 2018.10.22

Affirmation	Tested By Name : OH DONG-UK <i>duoh</i>	Technical Manager 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 lot from which the sample was taken or of apparently identical or similar products. The authenticity of this test report can be checked on KCL website(www.kcl.re.kr).		

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

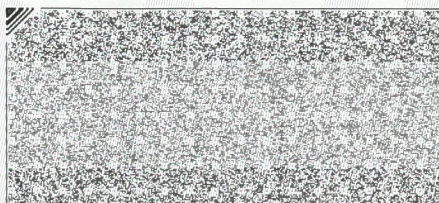
2018.10.22

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)	0.1	0.5	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)	13:24	13:22	-	≥ 9 minutes	KS F 2271 : 2016

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

※ Description of specimen(Provided by the client) :

Paint(0.03 mm) + Steel Plate(0.5 mm)

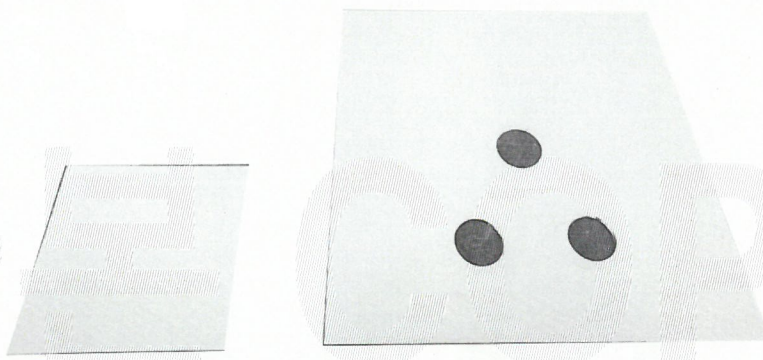


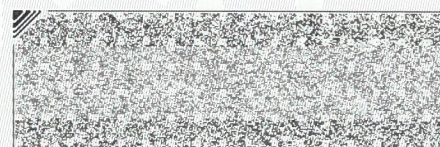
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Specimen and test condition

Items	Heat release test					
Date of test	2018. 09. 10 ~ 2018. 10. 22					
Test environment	Temp. (21 ~ 22) ℃, R.H. (39 ~ 40) %					
Thickness (mm)	TEST 1 :	0.5	TEST 2 :	0.5	TEST 3 :	0.5
Weight (g)	TEST 1 :	38.1	TEST 2 :	36.6	TEST 3 :	36.6
Density of the specimen (kg/m³)	TEST 1 :	7585.9	TEST 2 :	7583.1	TEST 3 :	7506.5
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) ℃, R.H. (50 ± 5) % (ISO 554)					
C-factor (m ^{1/2} · g ^{1/2} · K ^{1/2})	0.045 312					
						
Items	Gas toxicity test					
Test duration (min)	15					
Mouse	ICR group female					
Average weight of the mouse(g)	① 19 ② 19					

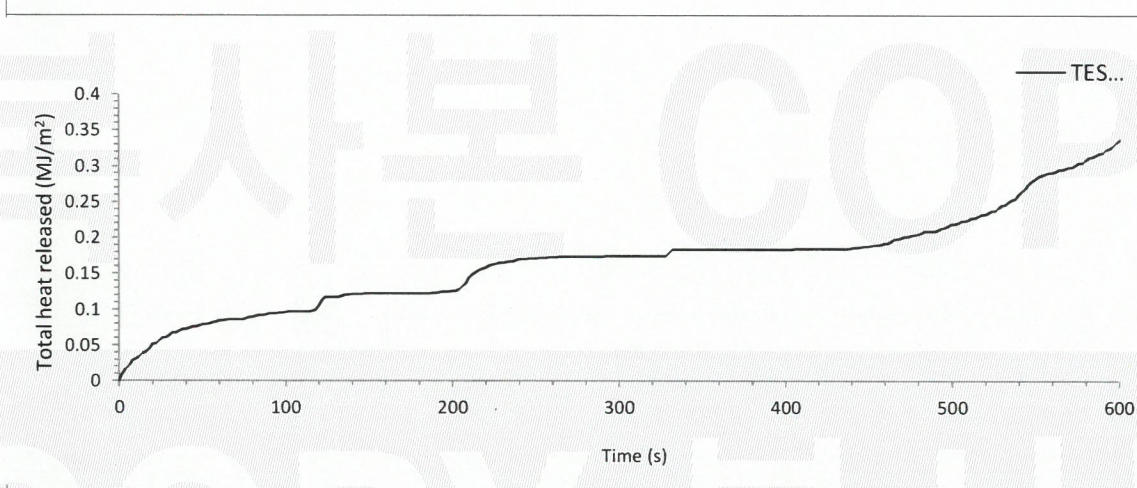
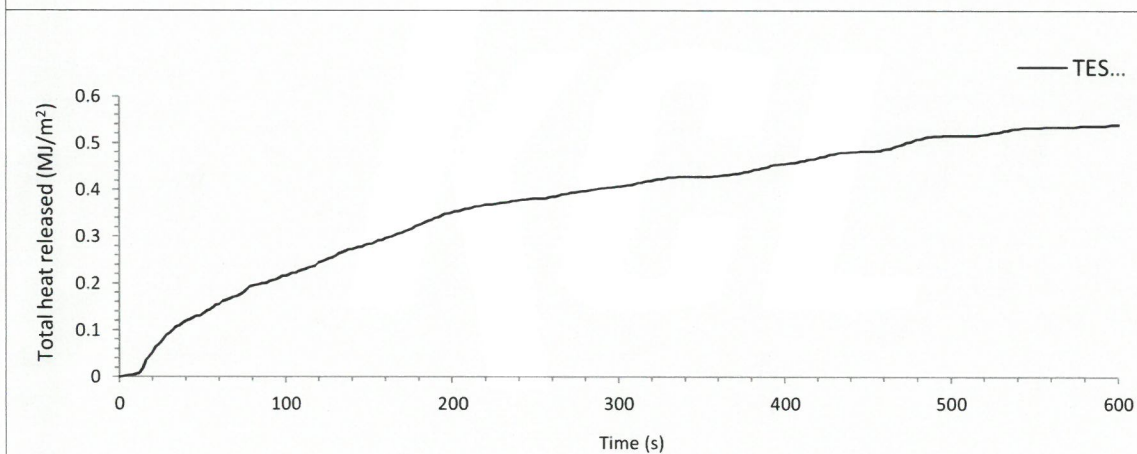
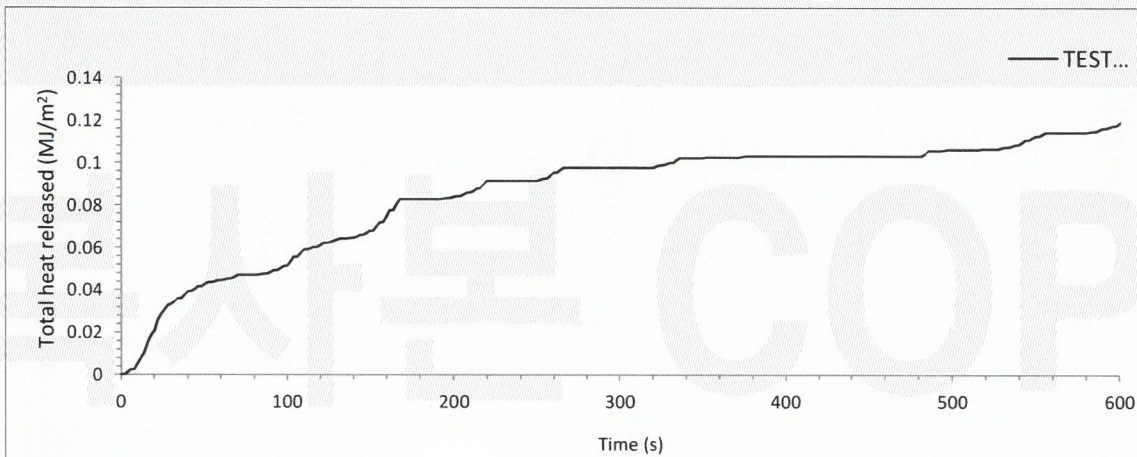


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Total heat released



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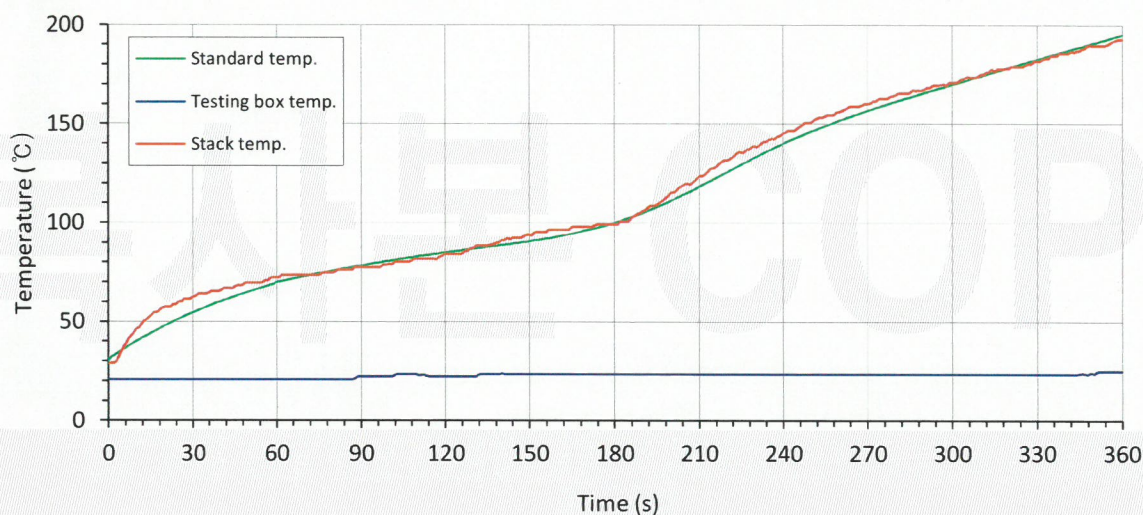
Gas toxicity test result

No	Stock	Sex	Average weight (g)	Time to incapability of moving
No. 1	ICR	Female	19	13 min 24 s
No. 2	ICR	Female	19	13 min 22 s

<Gas temperature>

Time (s)	Standard Temp. (°C)	Measured Temp. (°C)	Temp. deviation (°C)
0.0	30.0	28.5	-1.5
60.0	70.0	72.2	2.2
120.0	85.0	84.3	-0.7
180.0	100.0	99.3	-0.7
240.0	140.0	145.2	5.2
300.0	170.0	171.0	1.0
360.0	195.0	192.6	-2.4

<Gas temperature graph>



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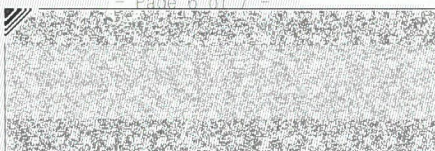
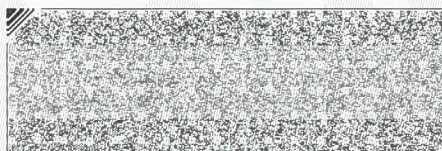
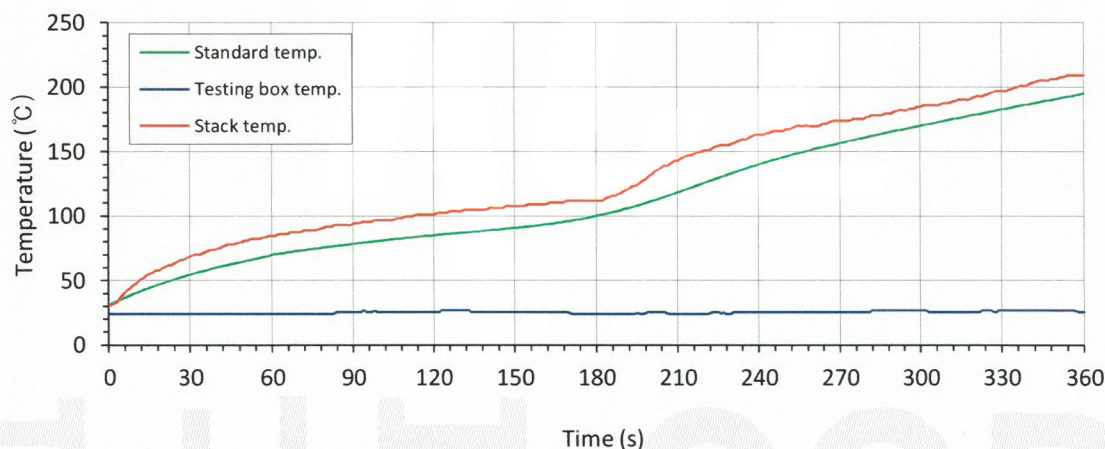


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Test No : No. 1

Time (s)	Box temp. (°C)	Gas temp. (°C)
0	30	31
60	30	85
120	30	101
180	30	112
240	30	163
300	30	185
360	30	209

No. of mice	Time to incapability
M1	14 min 08 s
M2	14 min 18 s
M3	13 min 42 s
M4	13 min 37 s
M5	13 min 29 s
M6	14 min 42 s
M7	13 min 02 s
M8	14 min 32 s
Average	13 min 56 s
Standard deviation	00 min 32 s
Test result	13 min 24 s



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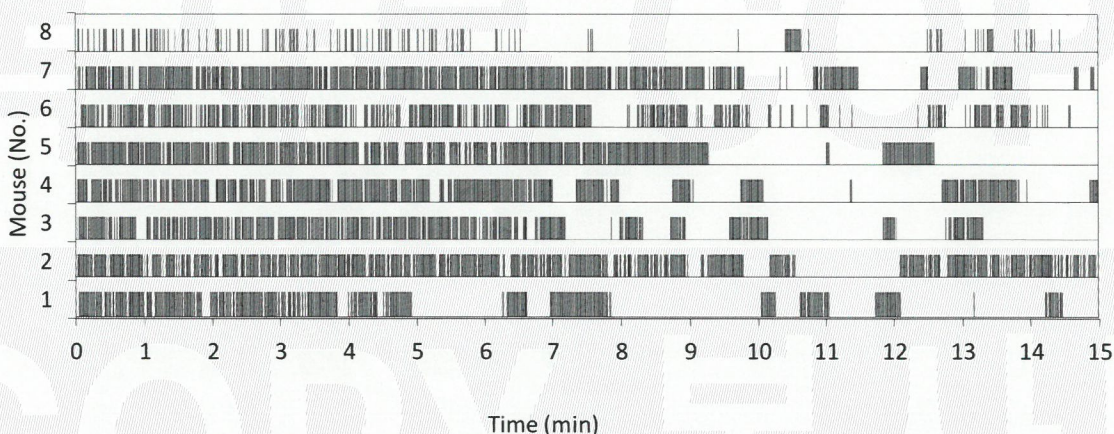
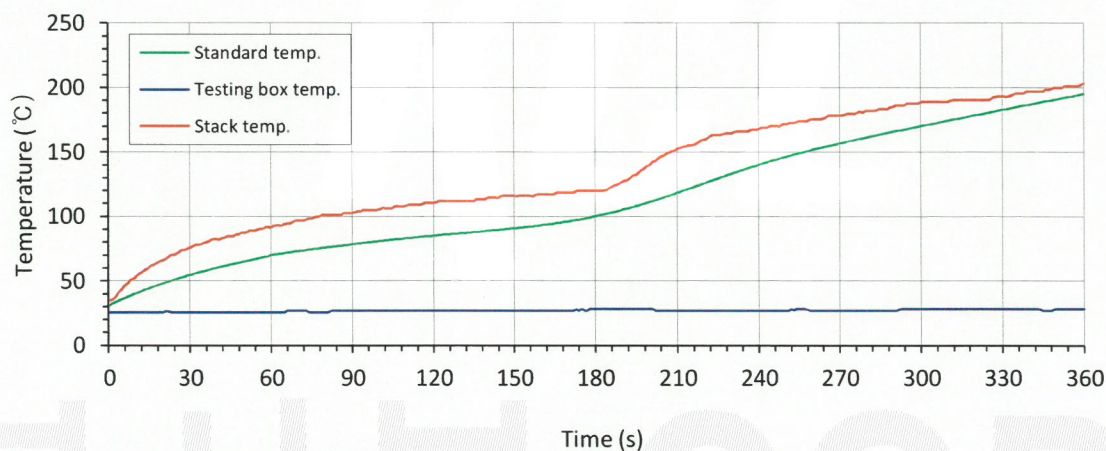


NO : CT18-098281

Test No : No. 2

Time (s)	Box temp. (°C)	Gas temp. (°C)
0	30	35
60	30	92
120	30	110
180	30	120
240	30	168
300	30	189
360	30	203

No. of mice	Time to incapability
M1	14 min 29 s
M2	14 min 58 s
M3	13 min 19 s
M4	13 min 58 s
M5	12 min 35 s
M6	14 min 36 s
M7	14 min 57 s
M8	14 min 27 s
Average	14 min 09 s
Standard deviation	00 min 47 s
Test result	13 min 22 s



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

