



## TEST REPORT

No. : XMIN171002210CCM

Date : Mar.15, 2018

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CUSTOMER NAME: FAZAH INDUSTRIAL COMPANY  
ADDRESS: SECOND INDUSTRIAL AREA AI KHARJ ROAD, RIYADH SAUDI ARABIA

Sample Name : FIRE RETARDANT ACP

Material : FR A2 CORE MATERIAL

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

\*\*\*\*\*

SGS Ref. No. : GZIN1710049605MR, KV-17-10132, SHIN171003314CCM,  
AJFS1710009057FF, SDHL1710021757FB, SDHL1802003324FB

Date of Receipt : Oct.17, 2017

Testing Start Date : Oct.19, 2017

Testing End Date : Mar.08, 2018

Test result(s) : For further details, please refer to the following page(s)  
(Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

\*\*\*\*\* To be continued\*\*\*\*\*

Signed for  
SGS-CSTC Standards Technical  
Services Co. , Ltd Xiamen Branch  
Testing Center

Civi Huang  
Authorized signatory



SGS-CSTC Standards Technical Services Co., Ltd.  
Xiamen Branch Testing Center Commercial Construction Material Laboratory

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## Summary of Result(s):

No.	Test Item(s)	Test Method	Result(s)	SASO 2752/2016 requirement(s)
1	Adhesion Test of Coatings	With reference to SASO 2752:2016 Section 2.15 & ISO 2409-2013 and client's requirement	0 (classification 0 is the best and classification 5 is the worst)	≥Grade 1
2	Brush Resistance Test	With reference to SASO 2752:2016 Section 2.18 & ISO 11998-2006 Section 8.2 and client's requirement	Visual abrasion trace, but no worn-out to the substrate	≥10000times of no change
3	Coating Thickness	ISO 2360:2003	33.6μm	External wall: ≥25μm Internal wall: ≥16μm
4	Cyclic Corrosion Test	SASO 2752:2016 Section 2.20 & ISO 11997-1:2005 Cycle B	Number of blister: 0	The number of blister ≤ 7
5	Falling Sand Abrasion	With reference to SASO 2752:2016 Section 2.17 & ASTM D968-15 Method A and client's requirement	>2.3L/μm	External wall: ≥2L/μm Internal wall: /
6	Gloss	With reference to SASO 2752:2016 Section 2.12 & ISO 2813:2014 and client's requirement	20° Geometry: 9.3	Reflectance≥70, at 20 °
			85° Geometry: 65	Reflectance≤5, at 85 °
7	Impact Resistance	With reference to SASO 2752:2016 Section 2.16 & ISO 6272-2:2011 and client's requirement	No cracking or peeling	No peel-off, no crack

\*\*\*\*\* To be continued\*\*\*\*\*



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No.	Test Item(s)	Test Method	Result(s)		SASO 2752/2016 requirement(s)
8	Light Ageing Test- Xenon-arc Exposure	With reference to SASO 2752:2016 Section 2.19 & ISO 16474-2:2013 & ASTM D2244-16 & ASTM D523-14 and client's requirement	Gloss loss(60°): 24.1% No visual change $\Delta E^*_{ab}$ : 0.2		Gloss change $\leq$ 10% Other aging performance: no change
9	Pencil Hardness	With reference to SASO 2752:2016 Section 2.13 & ISO 15184:2012 and client's requirement	H		F-2H minimum
10	Hot water Resistance (Immersion Method)	With reference to SASO 2752:2016 Section 2.22 & ISO 2812-2:2007 and client's requirement	No visual change		No change for a temperature of 99 $\pm$ 1 °C for 2h
11	Coating Flexibility	With reference to SASO 2752:2016 Section 2.14 & ISO 17132:2007 and client's requirement	No cracking or damage with 0T; See result		External wall: $\geq$ 2 without any cracks or damage on the coating Internal wall: $\geq$ 3 without any cracks or damage on the coating
12	Deflection Temperature under Load	SASO 2752:2016 Section 2.8 & ISO 75-1:2013 & ISO 75-2:2013 Method A	107 °C		$\geq$ 85 °C
13	Flexural Test	SASO 2752:2016 Section 2.5 & ISO 178:2010/Amd.1:2013 Method A	Flexural Strength	138MPa	$\geq$ 70MPa
			Flexural Modulus	19000MPa	$\geq$ 1200MPa
14	Peel Strength	SASO 2752:2016 Section 2.7 & ISO 8510-2:2014	327N(12.6N/mm)		$\geq$ 9.0 N/mm
15	Reagent Resistance (Immersion Method)	With reference to SASO 2752:2016 Section 2.21 & ISO 2812-1:2007 and client's requirement	No visual change		No change

\*\*\*\*\* To be continued\*\*\*\*\*



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No.	Test Item(s)	Test Method	Result(s)	SASO 2752/2016 requirement(s)
16	Shear Strength	SASO 2752:2016 Section 2.6 & ASTM D732-17	34.4MPa	≥30MPa
17	Tensile Strength	SASO 2752:2016 Section 2.4 & ISO 527-2:2012	53.3MPa	≥30MPa
18	Coefficient of linear thermal expansion	With reference to SASO 2752:2016 Section 2.9 & ASTM D696-16	-30°C ~ 30°C: 41.28μm/m·°C	≤200 μm/m·°C
19	Thermal conductance	With reference to SASO 2752:2016 Section 2.10 & ASTM C518-15	25 W/(m <sup>2</sup> ·K)	≤4.5 W/(m·K)
	Thermal resistance		0.040 (m <sup>2</sup> ·K)/W	≥0.2 (m <sup>2</sup> ·K)/W
20	Self-ignition temperature	With reference to SASO 2752:2016 Section 2.11 & ASTM D1929-2016	FIT = 490 °C SIT = 470 °C	SIT ≥ 343 °C
21	Surface Burning	With reference to SASO 2752:2016 Section 2.23 & ASTM E 84-17	Flame-spread Index (FSI): 5 Smoke-developed Index (SDI): 5 Class A	Flame-spread Index≤25; Smoke-developed Index≤450
22	Non-combustibility (core material)	With reference to SASO 2752:2016 Section 2.1 & ISO 1182:2010	Weight loss: 32.9%; Sustained flaming occurred	Weight loss≤50%; No sustained flaming

Note: 1. Pass: Meet the requirements;

Fail: Does not meet the requirements;

/: Not Apply to the judgment.

2. The protected film was ripped off before test.

3. Test items 1~17 were carried out by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch, test item 18 was carried out by SGS Taiwan Ltd., test item 19 was carried out by SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd., test item 20 was carried out by SGS-CSTC Standards Technical Services Co., Ltd. Anji Branch, Test items 21~22 were carried out by SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch.

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### 1. Adhesion Test of Coatings

#### Test Method:

With reference to SASO 2752:2016 Section 2.15 & ISO 2409-2013 and client's requirement

Sample Description: See photo

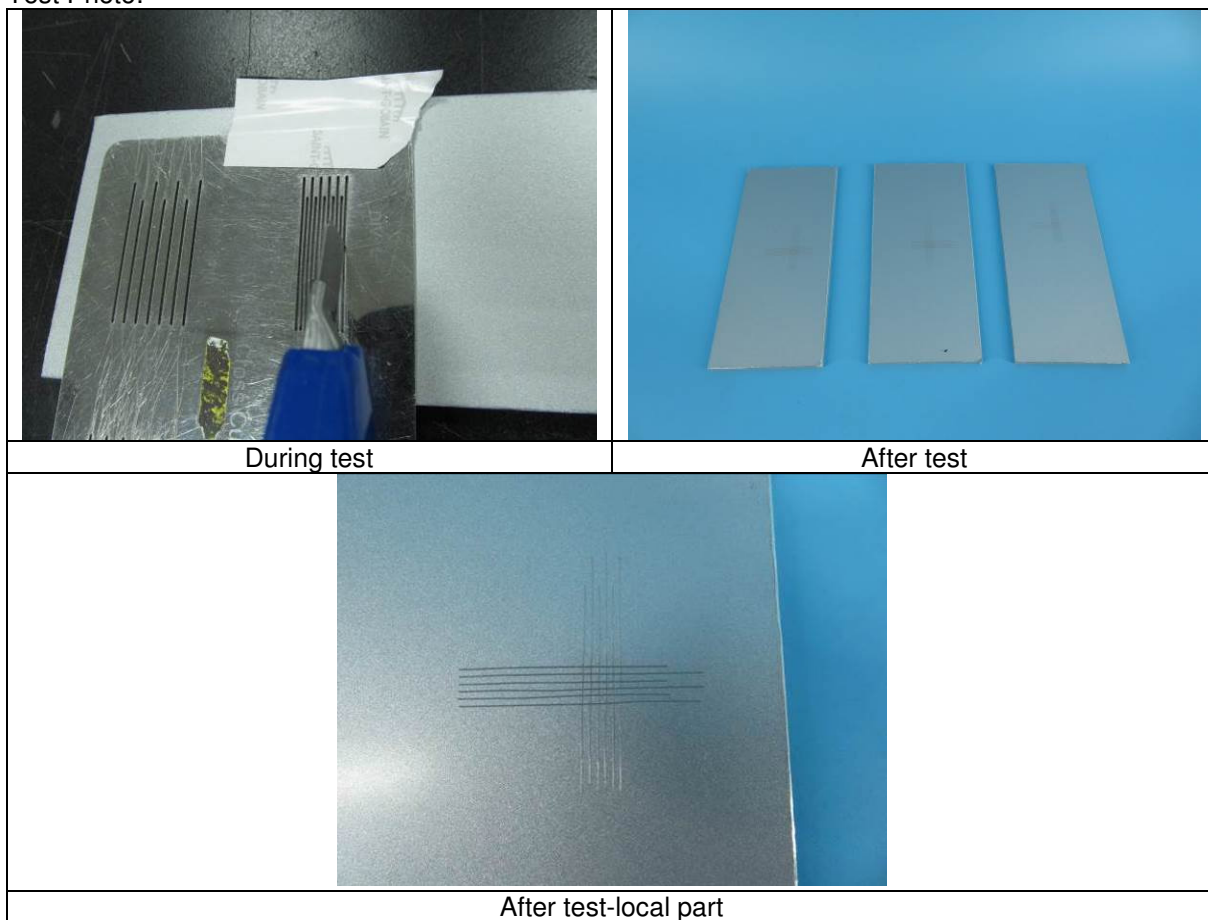
Test Condition: Space: 1mm      Tape: 3M 600(Scotch®)

#### Test Result:

Sample	Adhesion classification
A	0

Note: According to ISO 2409:2013, in the adhesion classification--Classification 0 is the best and classification 5 is the worst.

#### Test Photo:



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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Cross Rules	BGD503	GZMR-AG-E036-05	2017-05-19	2018-05-18

2. Brush Resistance Test

**Test Method:**

With reference to SASO 2752:2016 Section 2.18 & ISO 11998-2006 Section 8.2 and client's requirement.

Sample Description: See photo

Test Condition:

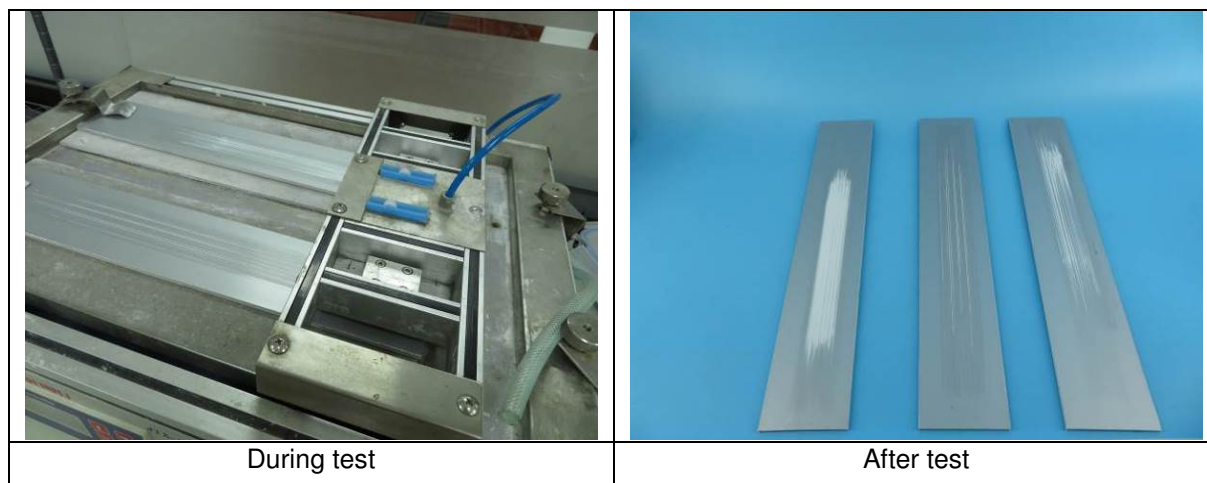
- Abrasive pad: 3M Scotch Brite® No.7448
- Speed: 37 ± 2 cycles/min
- Load: 135 ± 1g
- Cycles: 10000
- Reagent: Deionized water

**Test Result:**

Sample	Appearance
A	Visual abrasion trace, but no worn-out to the substrate

Note: The protected film was ripped off before test.

Test Photo:



\*\*\*\*\* To be continued \*\*\*\*\*



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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Straight Line Washability Machine for Architecture Coatings	JTX-II	GZMR-AG-E151	2017-09-24	2018-09-23

3. Coating Thickness

**Test Method:**

ISO 2360:2003

Sample Description: See photo

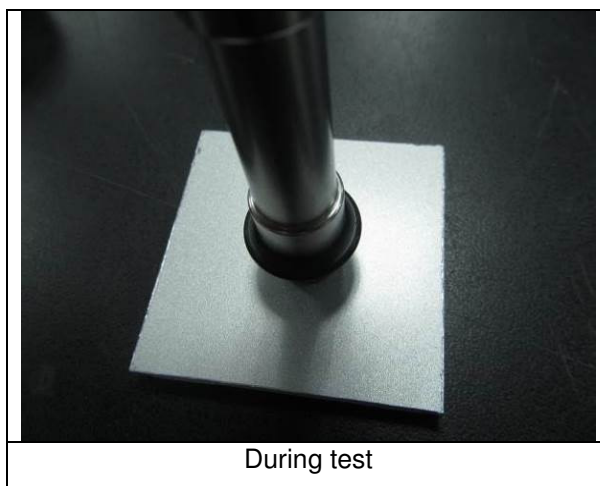
Test Condition: Eddy Current Method

**Test Result:**

Sample	Coating Thickness
A	33.6μm

Note: The protected film was ripped off before test.

Test Photo:



\*\*\*\*\* To be continued\*\*\*\*\*



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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Digital Coating Thickness Gauge	FNbasic	GZMR-AG-E170	2017-02-24	2018-02-23

4. Cyclic Corrosion Test

**Test Method:**

SASO 2752:2016 Section 2.20 & ISO 11997-1:2005 Cycle B

Sample Description: See photo

Test Condition:

- ① Salt spray test(see note1),24h
  - ②(40±2)℃, 100%RH, 8h
  - ③(23±2)℃, (50±20)%RH, 16h
  - ④(40±2)℃, 100%RH, 8h
  - ⑤(23±2)℃, (50±20)%RH, 16h
  - ⑥(40±2)℃, 100%RH,8h
  - ⑦(23±2)℃, (50±20)%RH, 16h
  - ⑧(40±2)℃, 100%RH, 8h
  - ⑨ (23±2)℃, (50±20)%RH, 16h
  - ⑩(23±2)℃, (50±20)%RH, 48h
- Step ①~⑩ as 1 cycle, total 5 cycles

**Test Result:**

Sample	Number of blister
A	#1 0
	#2 0
	#3 0

Note: Salt spray test

Concentration of salt solution: (50±10) g/L NaCl

Chamber temperature: (35±2)℃

Volume of salt solution collected: (1.0~2.0) ml/(80cm<sup>2</sup>·h)

pH of salt solution at 25℃: 6.0~7.0

\*\*\*\*\* To be continued\*\*\*\*\*



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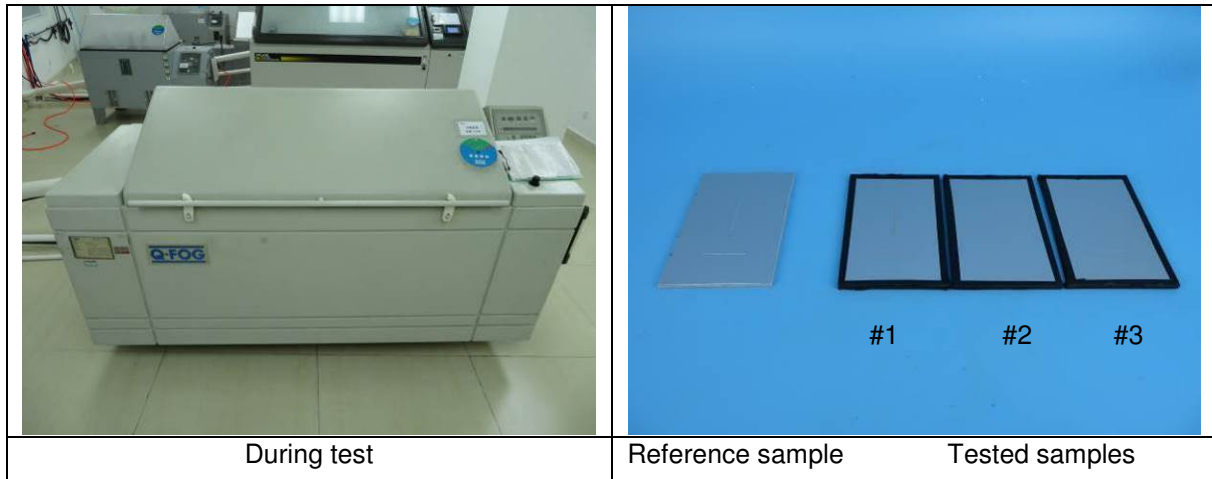
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Test Photo:



Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Cyclic Corrosion Tester	CCT1100	GZMR-AG-E050	2017-02-14	2018-02-13

### 5. Falling Sand Abrasion

#### **Test Method:**

With reference to SASO 2752:2016 Section 2.17 & ASTM D968-15 Method A and client's requirement

Sample Description: See photo

Test conditions:

Abrasive: Standard Abrasive

Falling Speed: 2L/21-23.5s

#### **Test Result:**

Sample	Abrasion resistance
A	>2.3L/μm

Note: The protected film was ripped off before test.

\*\*\*\*\* To be continued\*\*\*\*\*



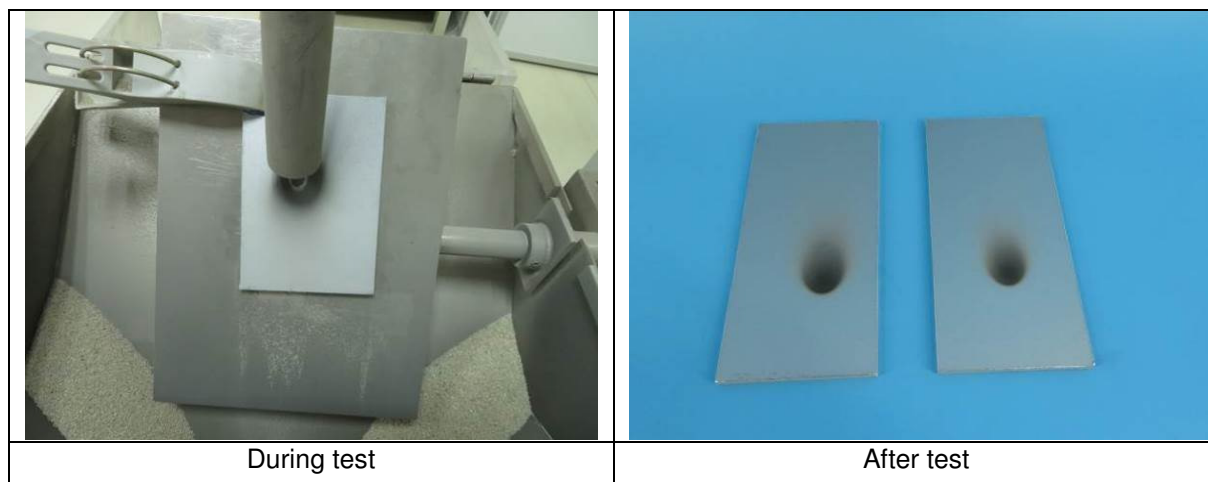
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Test Photo:



Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Falling Sand Abrasion Tester	TG-8310-AT	GZMR-AG-E140	2017-08-07	2018-08-06
Digital Coating Thickness Gauge	FNbasic	GZMR-AG-E170	2017-02-24	2018-02-23

### 6. Gloss

#### **Test Method:**

With reference to SASO 2752:2016 Section 2.12 & ISO 2813:2014 and client's requirement

Sample Description: See photo

#### **Test Result:**

Sample	Result
A	20° Geometry: 9.3
	85° Geometry: 65

Note: The protected film was ripped off before test.

\*\*\*\*\* To be continued\*\*\*\*\*



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Test Photo:



Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Specular Gloss Meter	4446	GZMR-AG-E119	2017-05-22	2018-05-21

## 7. Impact Resistance

### **Test Method:**

With reference to SASO 2752:2016 Section 2.16 & ISO 6272-2:2011 and client's requirement

Sample Description: See photo

Test Condition:

Coating thickness: 33.6µm

Sample thickness: 3.21mm

Diameter of the punch: 15.9mm

Impact model: Reverse

Load: 2000g

Impact height: 100cm

### **Test Result:**

Sample	Appearance
A	No cracking or peeling

Note: The protected film was ripped off before test.

\*\*\*\*\* To be continued\*\*\*\*\*



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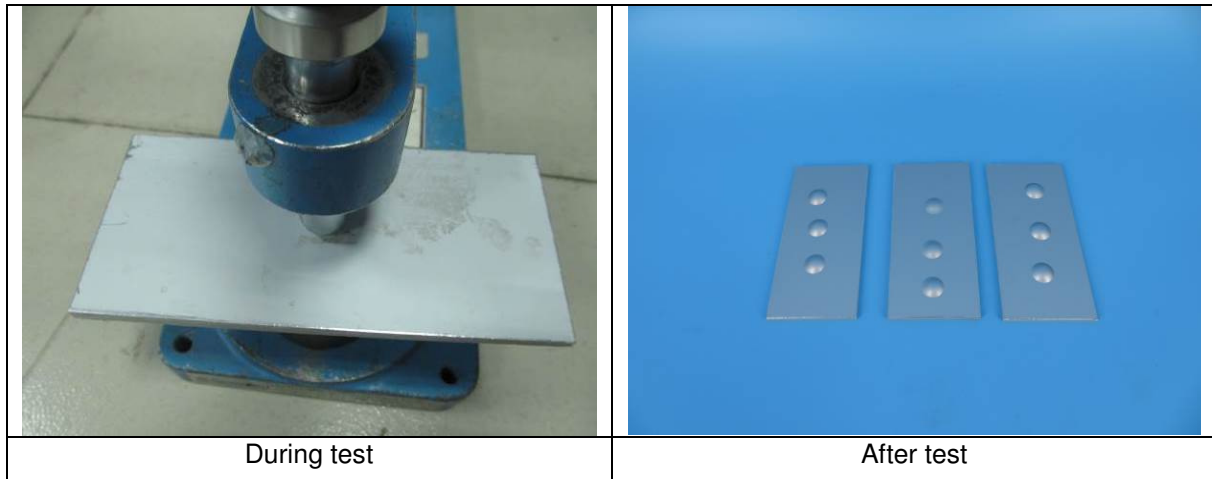
## TEST REPORT

No. : XMIN171002210CCM

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Test Photo:



Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Impact Tester	IG-1121	GZMR-AG-E004	2017-06-12	2018-06-11
Digital Vernier Caliper	0~200mm/0.01m m	GZMR-AG-E128-01	2017-08-10	2018-08-09
Digital Coating Thickness Gauge	FNbasic	GZMR-AG-E170	2017-02-24	2018-02-23

### 8. Light Ageing Test-Xenon-arc Exposure

#### Test Method:

With reference to SASO 2752:2016 Section 2.19 & ISO 16474-2:2013 & ASTM D2244-16 & ASTM D523-14 and client's requirement

Sample Description: See photo

Test Condition:

Exposure cycle:

ISO 16474-2:2013 Cycle 4

Irradiance:  $(0.51 \pm 0.02)W/(m^2 \cdot nm)@340nm$

102 min light at  $(63 \pm 3)^{\circ}C$  BPT,  $(38 \pm 3)^{\circ}C$  CT,  $(50 \pm 10)\% RH$

18 min light and water spray

Filter: Boro/Boro

Exposure period: 2000h

\*\*\*\*\* To be continued\*\*\*\*\*



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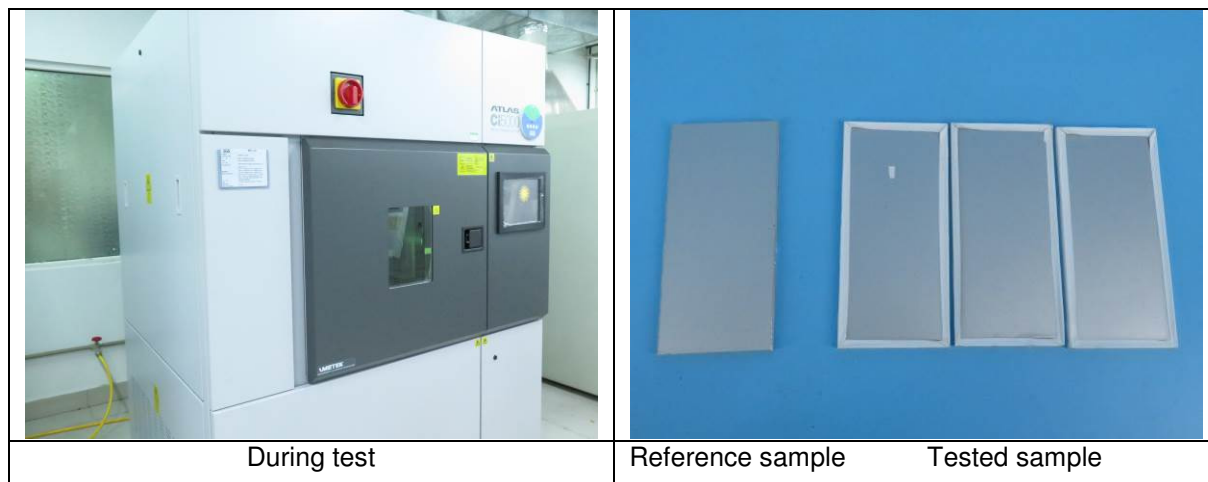
## Test Result:

Sample	$\Delta E^*_{ab}$	Gloss loss	Appearance
A	0.2	24.1%	No visual change

### Note:

- $\Delta E^*_{ab}$  was measured by sphere spectrophotometer under D65 standard light source and with 10° observer. The results include specular component reflection condition, 25 mm aperture.
- Gloss loss(60° geometry)= | the gloss after test - the gloss before test | /the gloss before test X100%. If the gloss increases, the gloss loss will be specified to 0.
- The protected film was ripped off before test.

### Test Photo:



## Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Xenon Weathering Tester	CI5000	GZMR-AG-E169	2017-11-14	2018-11-13
Sphere Spectrophotometer	Color i7	GZMR-AG-E155	2017-05-03	2018-05-02
Specular Gloss Meter	4446	GZMR-AG-E119	2017-05-22	2018-05-21

\*\*\*\*\* To be continued\*\*\*\*\*



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### 9. Pencil Hardness

#### **Test Method:**

With reference to SASO 2752:2016 Section 2.13 & ISO 15184:2012 and client's requirement

Sample Description: See photo

Test Condition:

Test Pencil: Mitsubishi® Uni

Load: (750±10) g

#### **Test Result:**

Sample	Pencil Hardness (See note 1)
A	H

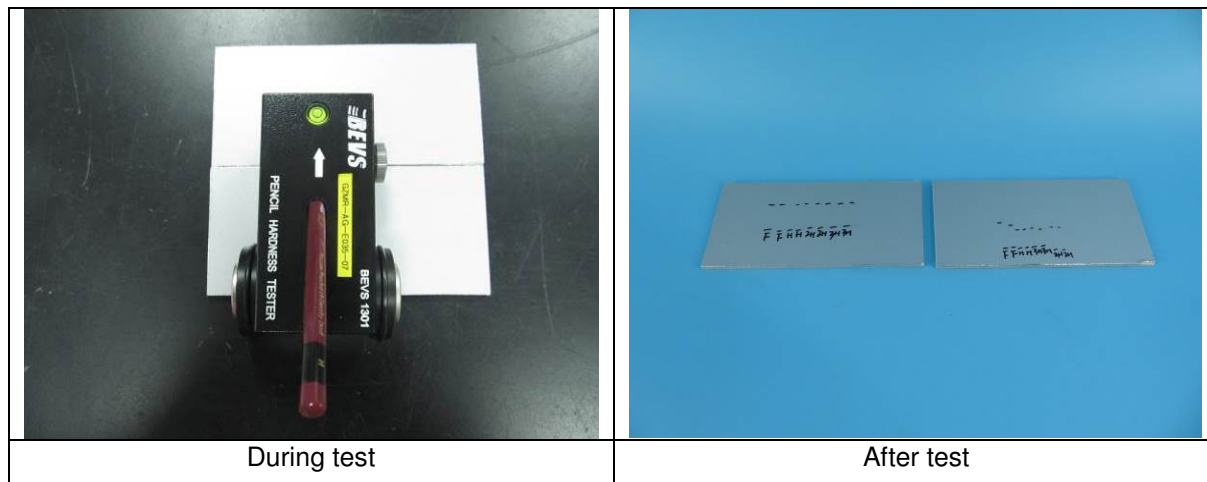
Note: 1. In Mitsubishi® Uni test pencil, 9H is the hardest and 6B is the softest.

6B-5B-4B-3B-2B-B-HB-F-H-2H-3H-4H-5H-6H-7H-8H-9H

softer ←-----→ harder

2. The protected film was ripped off before test.

Test Photo:



\*\*\*\*\* To be continued\*\*\*\*\*



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**Equipment Information:**

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Pencil Hardness Tester	BEVS 1301/750	GZMR-AG-E035-06	2016-12-21	2017-12-20

**10. Water Resistance (Immersion Method)**

**Test Method:**

With reference to SASO 2752:2016 Section 2.22 & ISO 2812-2:2007 and client's requirement

Sample Description: See photo

Test Condition:

Temperature: 99°C

Duration of the test: 2h

**Test Result:**

Sample	Appearance
A	No visual change

Note: The protected film was ripped off before test.

\*\*\*\*\* To be continued\*\*\*\*\*



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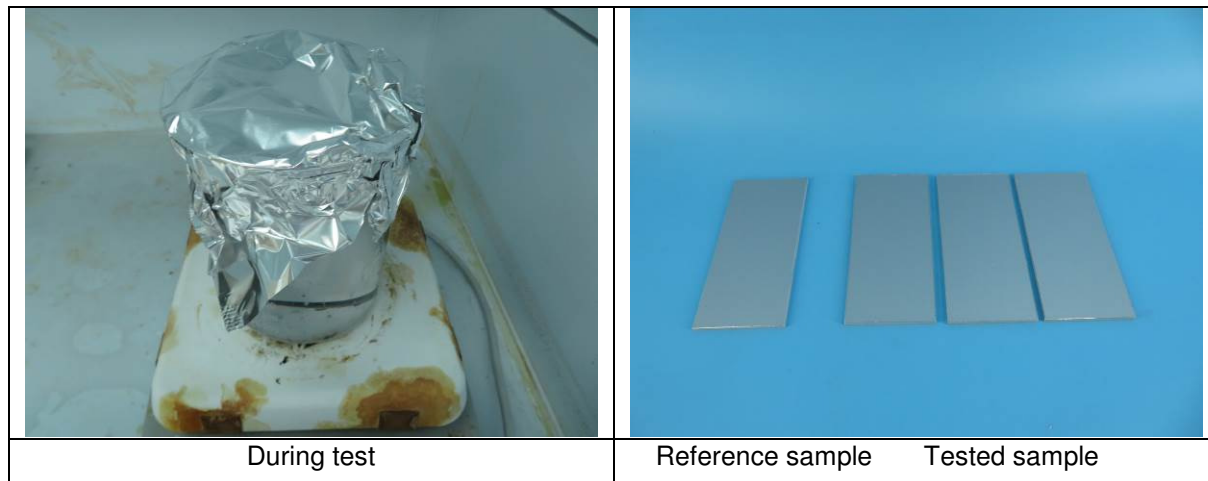
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Test Photo:



### 11. Coating Flexibility

#### **Test method:**

With reference to SASO 2752:2016 Section 2.14 & ISO 17132:2007 and client's requirement

Sample Description: See photo

Test Condition:

Thickness of spacer panels: 3.21mm

Diameter of mandrel: 3mm

#### **Test result(s):**

Sample	Test Condition	Appearance
A	T <sub>p</sub>	No cracking or damage with OT
	T <sub>f</sub>	No cracking or damage with OT
	T <sub>m</sub>	No cracking or damage with OT

Note: The protected film was ripped off before test.

\*\*\*\*\* To be continued\*\*\*\*\*



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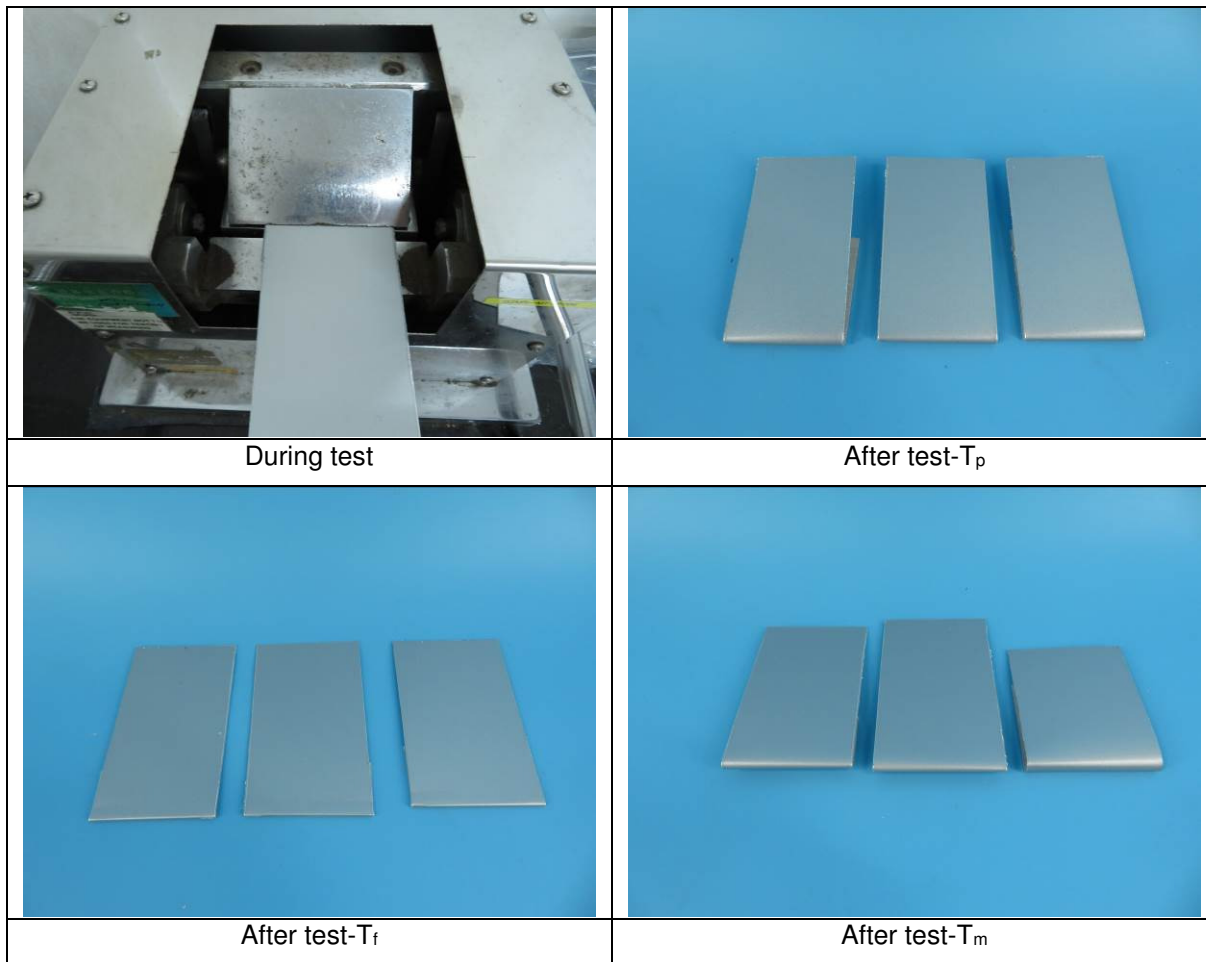
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Test Photo:



### 12. Deflection Temperature under Load

#### Test Method:

SASO 2752:2016 Section 2.8 & ISO 75-1:2013 & ISO 75-2:2013 Method A

Sample Description: See photo

\*\*\*\*\* To be continued\*\*\*\*\*



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**Test Condition:**

Specimen: 80mm×10.25mm×4.40mm

Heat-transfer media: Silicone oil

T<sub>f</sub>1.8

Rate of temperature:120°C/h

Span: 64mm

Lab Environmental Condition: (23±2)°C, (50±5)%RH

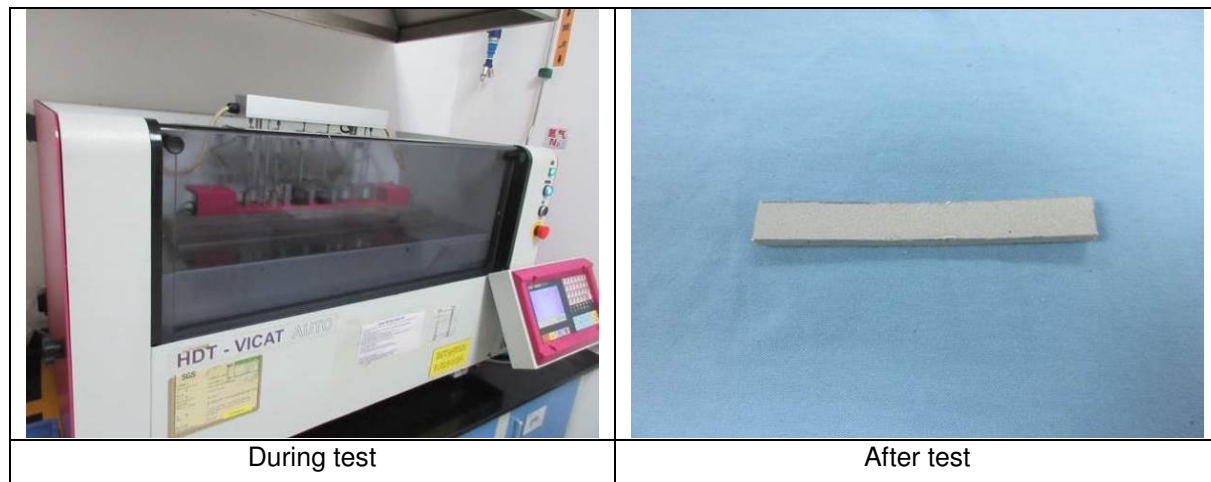
**Test Result:**

Sample	Test Item	Test Result
A	Deflection Temperature under Load	107°C

Note: 1. The surface with protected film was faced to the loading.

2. The protected film was ripped off before test.

**Test Photo:**



**Equipment Information:**

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
HDT and VICAT Tester	6970.000	GZMR-PL-E091	2017-05-08	2018-05-07

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### 13. Flexural Test

#### **Test Method:**

SASO 2752:2016 Section 2.5 & ISO 178:2010/Amd.1:2013 Method A

Sample Description: See photo

Test Condition:

Specimen: 80mm×10.22mm×4.42mm

Testing speed: 2mm/min

Span: 64mm

Lab Environmental Condition: (23±2)°C, (50±5)%RH

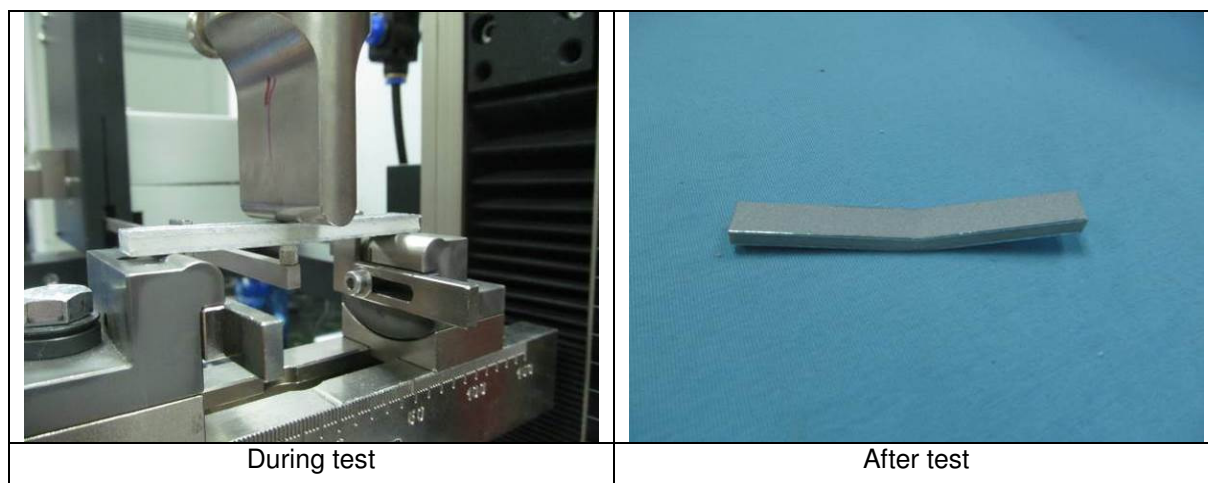
#### **Test Result:**

Test Item	Test Result
Flexural Strength	138MPa
Flexural Modulus	19000MPa

Note:1. The surface with protected film was faced to the loading.

2. The protected film was ripped off before test.

Test Photo:



\*\*\*\*\* To be continued\*\*\*\*\*



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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Universal Testing Machine	Z1.0	GZMR-PL-E168	2017-10-10	2018-10-09

14. Peel Strength

**Test Method:**

SASO 2752:2016 Section 2.7 & ISO 8510-2:2014

Sample Description: See photo

Test Condition:

Specimen width: 26mm

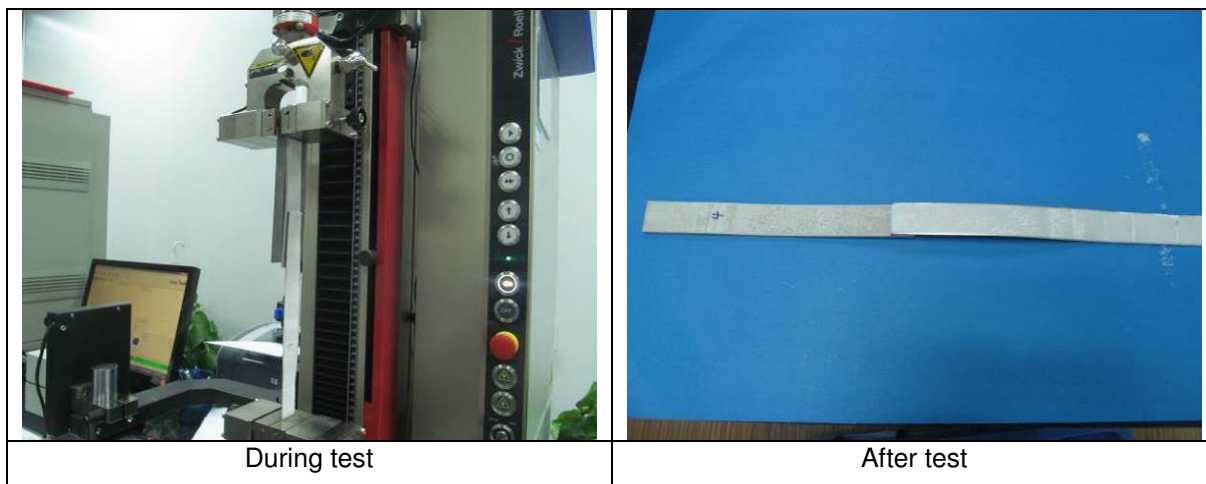
Testing speed: 100mm/min

Lab Environmental Condition: (23±2)°C, (50±5)%RH

**Test Result:**

Test Item	Test Result
Peel strength	327N

Test Photo:



\*\*\*\*\* To be continued\*\*\*\*\*



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Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Universal Testing Machine	Z1.0	GZMR-PL-E168	2017-10-10	2018-10-09

15. Reagent Resistance (Immersion Method)

**Test Method:**

With reference to SASO 2752:2016 Section 2.21 & ISO 2812-1:2007 and client's requirement

Sample Description: See photo

Test Condition:

Test Temperature: 23°C

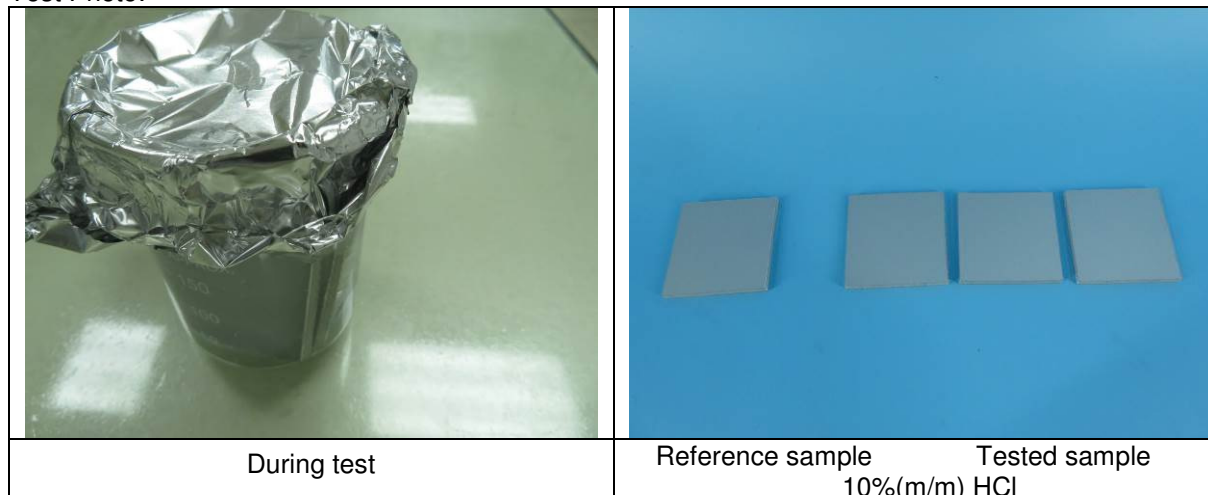
Duration of the test: 72h

**Test Result:**

Sample	Reagent	Appearance
A	10%(m/m) HCl	No visual change
	5%(m/m) NaOH	No visual change
	Mitsubishi® DiaQueen Motor Engine Oil SL GF-3 10W-30	No visual change
	Isopropanol	No visual change

Note: The protected film was ripped off before test.

Test Photo:



During test

Reference sample      Tested sample  
10%(m/m) HCl

\*\*\*\*\* To be continued \*\*\*\*\*



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Reference sample 5%(m/m) NaOH	Tested sample 5%(m/m) NaOH	Reference sample Mitsubishi® DiaQueen Motor Engine Oil SL GF-3 10W-30	Tested sample Mitsubishi® DiaQueen Motor Engine Oil SL GF-3 10W-30
	Reference sample Isopropanol	Tested sample Isopropanol	

### Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electron Balance	PL2002	GZMR-AG-E125	2017-07-04	2018-07-03

\*\*\*\*\* To be continued \*\*\*\*\*



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### 16. Shear Strength

#### **Test Method:**

SASO 2752:2016 Section 2.6 & ASTM D732-17

Sample Description: See photo

Test Condition:

Specimen thickness: 4.33mm

Punch diameter: 25mm

Testing speed: 1.3mm/min

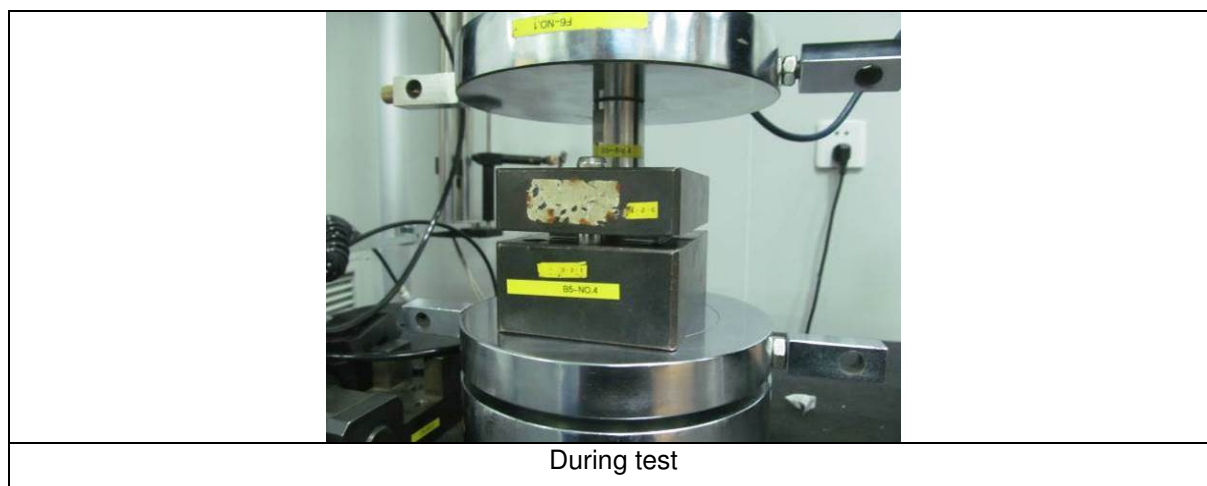
Lab Environmental Condition: (23±2)°C, (50±5)%RH

#### **Test Result:**

Test Item	Test Result
Shear Strength	34.4MPa

- Note: 1. The surface with protected film was faced to the loading.  
 2. The protected film was ripped off before test.  
 3. Test specimens were cut from the sample.

Test Photo:



\*\*\*\*\* To be continued\*\*\*\*\*



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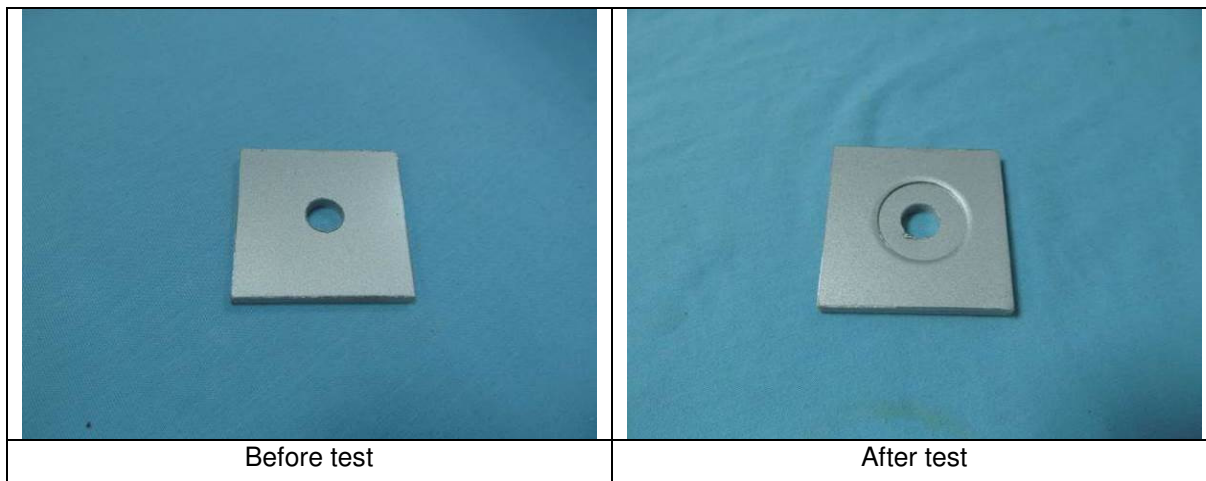
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### Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Universal Testing Machine	CMT4304	GZMR-PL-E062	2017-10-10	2018-10-09

### 17. Tensile Strength

#### Test Method:

SASO 2752:2016 Section 2.4 & ISO 527-2:2012

Sample Description: See photo

Test Condition:

Specimen: Type 1B

Specimen thickness: 4.46mm

Testing speed: 5mm/min

Initial distance between grips: 115mm

Lab Environmental Condition: (23±2)°C, (50±5)%RH

#### Test Result:

Test Item	Test Result
Tensile Strength	53.3MPa

Note: 1. The protected film was ripped off before test.  
2. Test specimens were cut from the sample.

\*\*\*\*\* To be continued\*\*\*\*\*



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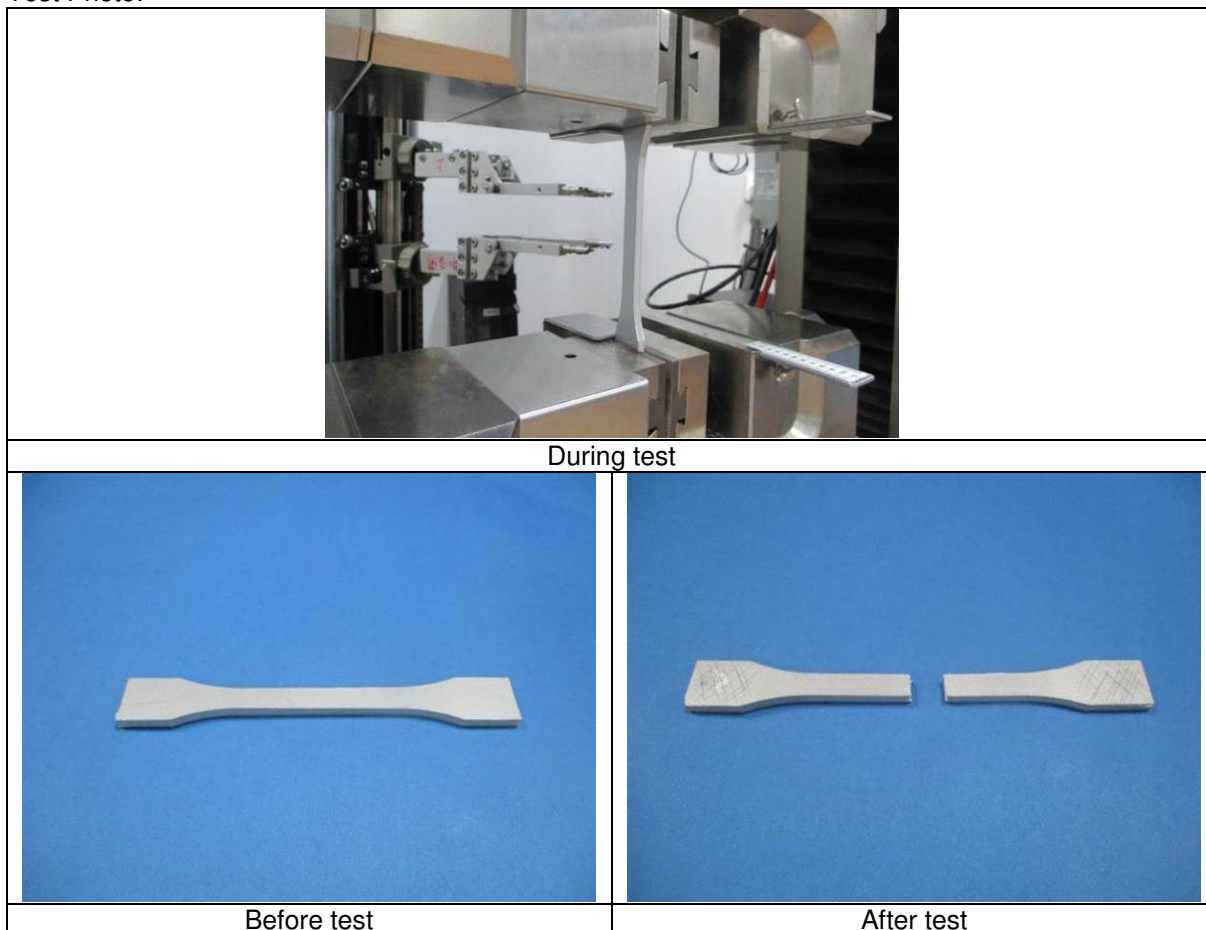
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Test Photo:



Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Universal Testing Machine	Z030	GZMR-PL-E140	2017-10-10	2018-10-09

\*\*\*\*\* To be continued\*\*\*\*\*



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18. Coefficient of linear thermal expansion

**Test Method:**

With reference to SASO 2752:2016 Section 2.9 & ASTM D696-16 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics

Between -30°C and 30°C with a Vitreous Silica Dilatometer

Test Condition:

Test temperature range: Ramp 10°C/min from -30°C to 30°C

Probe Type: Macroexpansion

Force: 0.05N

Measurement Direction/: X-Y

Purge gas: Nitrogen (N2), Purity 99.999%, Flow rate 50ml/min.

**Test Result:**

Test Item	Test Results
Coefficient of linear thermal expansion (µm/m·°C)	-30°C ~ 30°C: 41.28

\*\*\*\*\* To be continued\*\*\*\*\*



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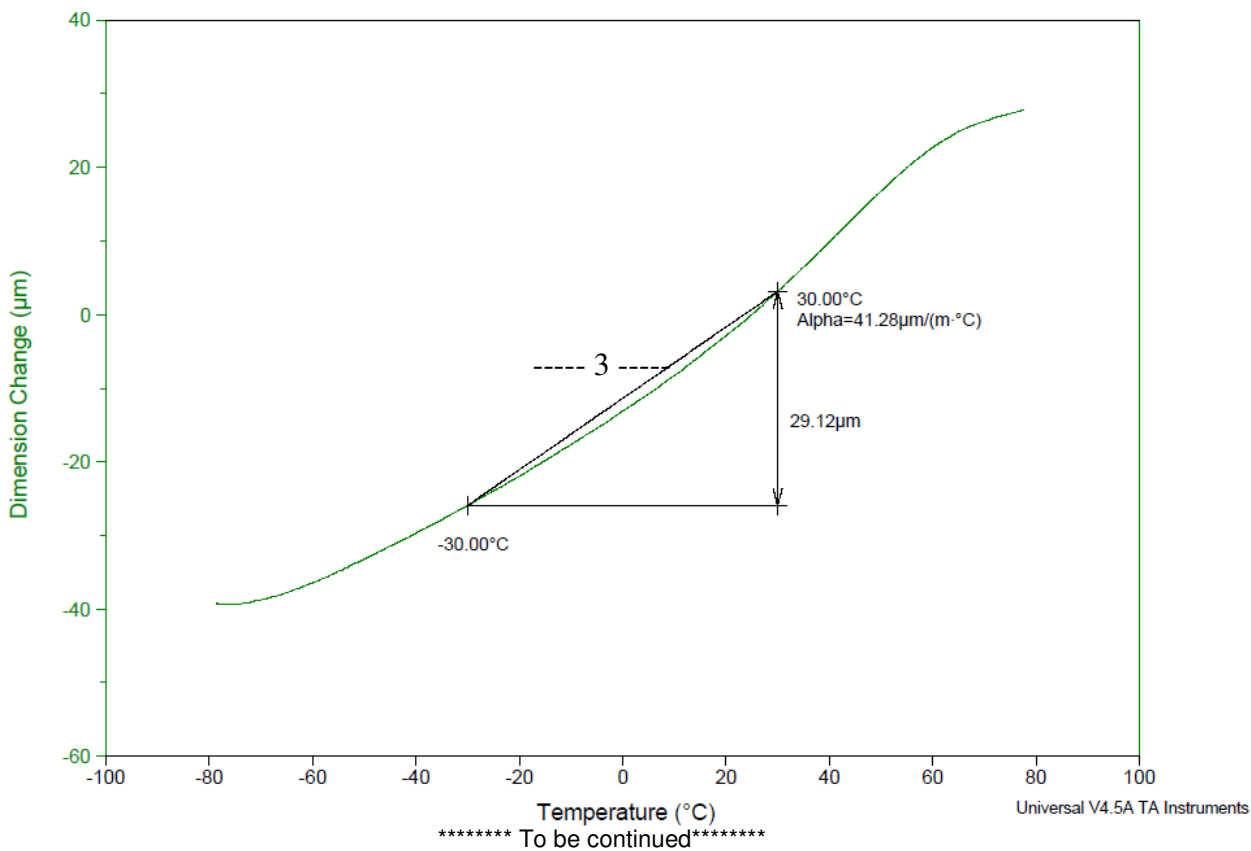
### Test Spectrum:

Sample: KV-17-10132  
Size: 11.7585 mm

TMA

File: C:\TA\Data\TMA\201710\KV-17-10132.001  
Operator: Mina Hsu  
Run Date: 31-Oct-2017 14:25  
Instrument: TMA Q400 V7.4 Build 93

Comment: Macroexpansion



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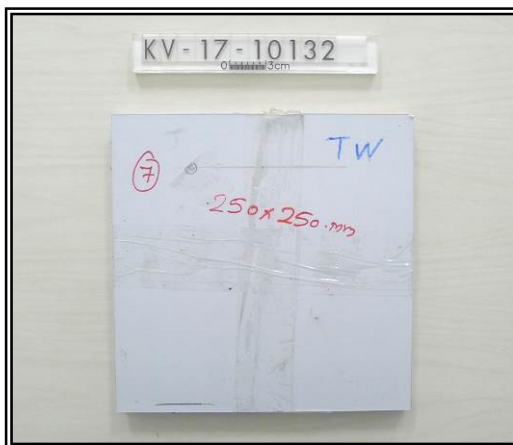
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**Sample Photo :**



**Test Equipment:**

Name	Brand	Model
Thermomechanical Analyzer (TMA)	TA	Q-400

19. Thermal conductance and Thermal resistance

**Test method:**

With reference to SASO 2752:2016 Section 2.10 & ASTM C518-15 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

**Test condition:**

Specimen: 300mm×300mm×4.4 mm, 1pc

Density: about 1730kg/m<sup>3</sup>

Mean temperature: 23°C

Temperature difference: 10°C

Lab environmental condition: 23±2°C, 50±5%RH

\*\*\*\*\* To be continued\*\*\*\*\*





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**Test result:**

Test Item	Test Result
Thermal conductance	25 W/(m <sup>2</sup> ·K)
Thermal resistance	0.040(m <sup>2</sup> ·K)/W

Note: The test result can not be compared with other results obtained from different test conditions, and should not be cited to the use condition directly.

Specimen photos:

This surface contacts hot plate	This surface contacts cold plate

20. Self-ignition temperature

**Test method:**

With reference to SASO 2752:2016 Section 2.11 & ASTM D1929–2016 Standard Test Method for Determining Ignition Temperature of Plastics.

Details of tested specimen

Description / Color	Aluminum Composite Panel / Sliver
Form of material (granules or sheet)	Sheet
Size of specimen	20mm×20mm
Mass of specimen	3.0 g

\*\*\*\*\* To be continued\*\*\*\*\*



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**Condition:**

The test specimens shall be conditioned at  $23 \pm 2^\circ\text{C}$  and  $50 \pm 5\%$  relative humidity for not less than 40h prior to test, in accordance with Practice D 618.

**Test results**

Flash ignition temperature (FIT) °C					
No.	T /°C	Observation and Ignition time	No.	T /°C	Observation and Ignition time
1	450	Ignition	4	490	Ignition
2	400	No ignition	5	480	No ignition
3	500	Ignition			

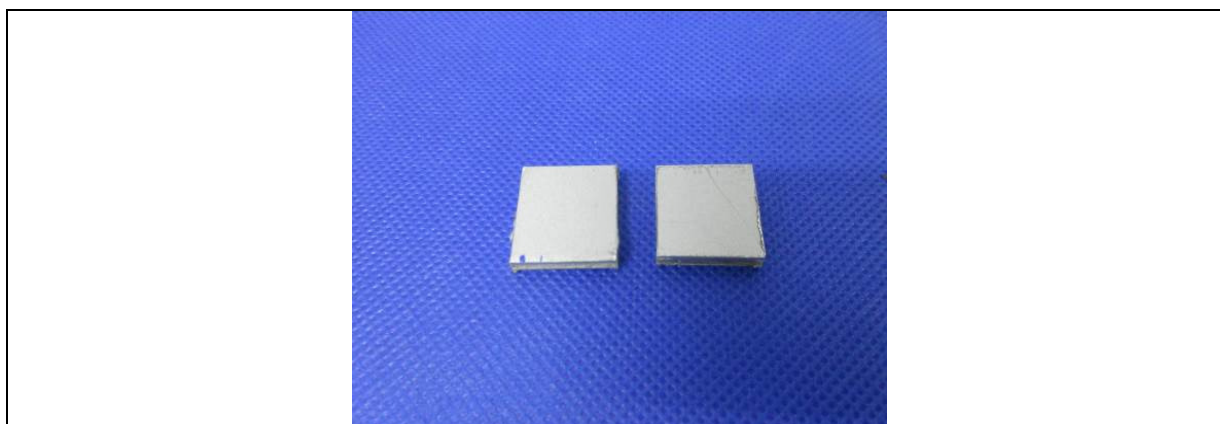
Spontaneous ignition temperature (SIT) °C					
No.	T /°C	Observation and Ignition time	No.	T /°C	Observation and Ignition time
1	400	No ignition	4	550	Ignition
2	450	No ignition	5	540	Ignition
3	500	No ignition	6	530	No ignition

Summary of test results: FIT = 490 °C SIT = 470 °C

**STATEMENTS**

The test results only to the ignitability of the sample or combination of materials under the particular condition of test. They are not intended as a means of assessing the full potential fire hazard of the materials or products in use.

**Photo Appendix:**



\*\*\*\*\* To be continued\*\*\*\*\*



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## 21. Surface Burning

### Test method:

With reference to SASO 2752:2016 Section 2.1 & ASTM E84-17 Standard Test Method for Surface Burning Characteristics of Building Materials

### Introduction:

The method, designated as ASTM E84-17, "Standard Method of Test for Surface Burning Characteristics of Building Materials", is designed to determine the relative surface burning characteristics of materials under specific test conditions. Results are expressed in terms of flame spread index (FSI) and smoke developed index (SDI).

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame spread and smoke developed index are reported. However, there is not necessarily a relationship between these two measurements.

### Test Procedure:

The tunnel is preheated to 150°F, as measured by the floor-embedded thermocouple located 23.25 feet downstream of the burner ports, and allowed to cool to 105°F, as measured by the floor-embedded thermocouple located 13 feet from the burners. At this time the tunnel lid is raised and the test sample is placed along the ledges of the tunnel so as to form a continuous ceiling 24 feet long, 12 inches above the floor. The lid is then lowered into place.

Upon ignition of the gas burners, the flame spread distance is observed and recorded every 15 seconds. Flame spread distance versus time is plotted ignoring any flame front recessions. If the area under the curve (A) is less than or equal to 97.5 min·ft, FSI = 0.515·A; if greater, FSI = 4900/(195·A). Smoke developed is determined by comparing the area under the obscuration curve for the test sample to that of inorganic reinforced cement board and red oak, arbitrarily established as 0 and 100, respectively.

### Sample Description:

Thickness	:	Approximately 4.5mm
Exposed face	:	Sample face

\*\*\*\*\* To be continued\*\*\*\*\*



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### Sample Preparation:

Prior to testing, the specimen was conditioned to constant weight at a temperature of 73 ± 5°F (23 ± 3°C) and a relative humidity of 50 ± 5%.

The test specimen consisted of a total of 3 sections of material. The sections were butted together during testing to form the requisite specimen length. The specimen was self-supporting on the ledges of the test chamber.

### Test Results:

Test data and observations:

Maximum flame spread (ft):	1.5
Time To Maximum Spread:	232 seconds.
Fallout:	None
Test Duration:	10 minutes.
FS*Time area (ft*min):	12.4
Smoke area (%A*min):	5.5
Red oak smoke area (%A*min):	90.8

### Summary of results:

Flame-spread Index (FSI)	Smoke-developed Index (SDI)
5	5

### Rating:

The National Fire Protection Association Life Safety Code 101, "Interior Wall and Ceiling Finish Classification", has a means of classifying materials with respect to Flame Spread and Smoke Developed when tested in accordance with NFPA 255, (ASTM E84) "Method of Test of Surface Burning Characteristics of Building Materials".

The classifications are as follows:

	Flame-Spread Index (FSI)	Smoke-developed Index (SDI)
Class A	0 - 25	0 - 450
Class B	26 - 75	0 - 450
Class C	76 - 200	0 - 450

\*\*\*\*\* To be continued\*\*\*\*\*



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# TEST REPORT

No. : XMIN171002210CCM

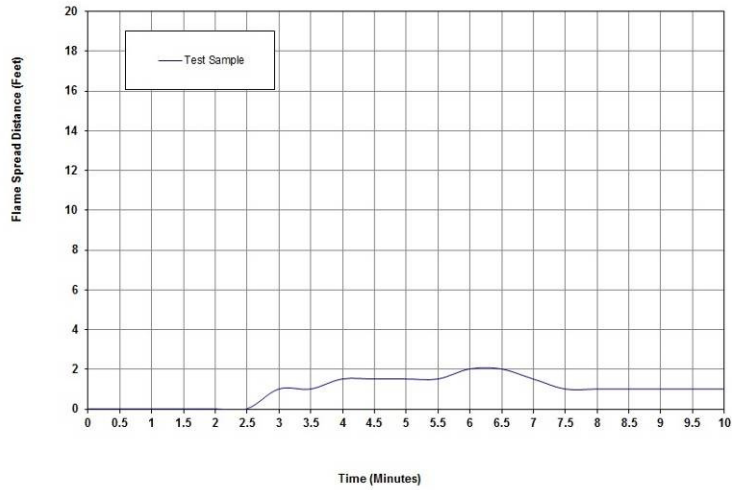
Date : Mar.15, 2018

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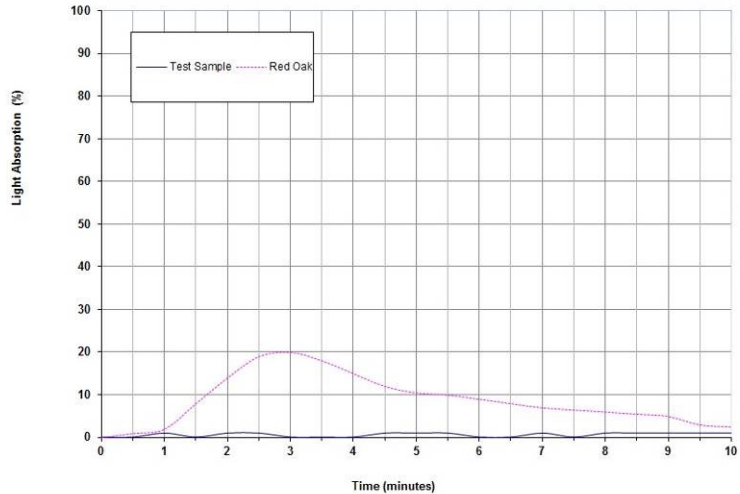
**Conclusion:**

Refer to the National Fire Protection Association Life Safety Code 101, "Interior Wall and Ceiling Finish Classification", the submitted sample meets the requirement of Class A.

Appendix 1-Graphs:



Graph1. Flame Spread Index



Graph2. Smoke Developed Index

\*\*\*\*\* To be continued \*\*\*\*\*



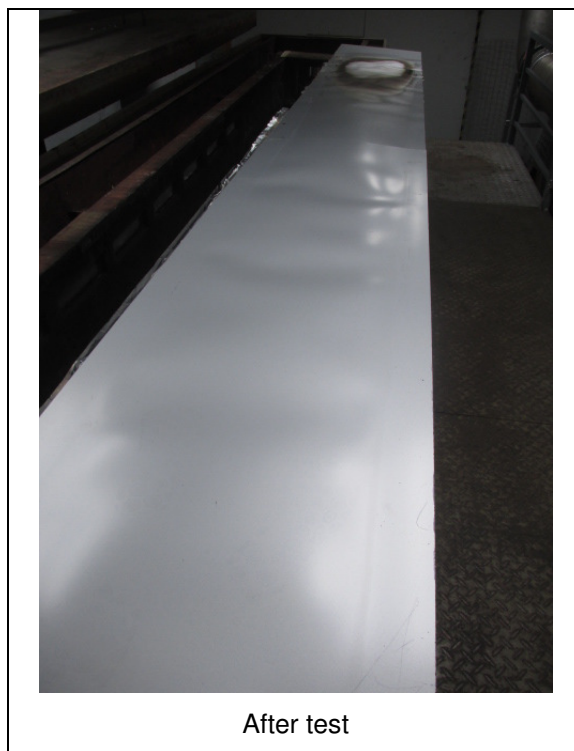
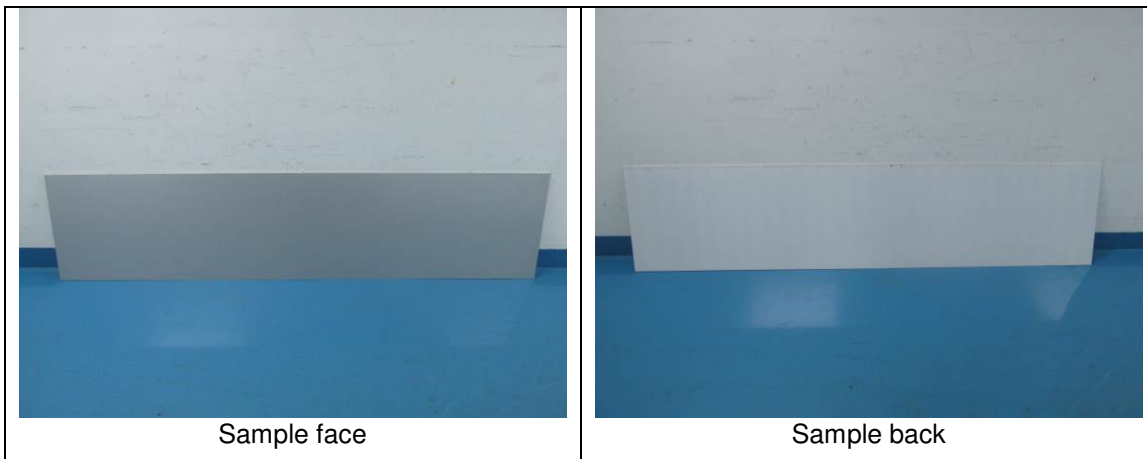
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### Appendix 2-Pictures:



\*\*\*\*\* To be continued \*\*\*\*\*



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## 22. Non-combustibility

### Test method:

With reference to SASO 2752:2016 Section 2.23 & ISO 1182:2010 Reaction to fire tests for products- Non-combustibility.

Conditioning of specimen:

Preconditioning: Temperature: (60±5) °C; Duration: 24h

### Test Results:

Specimen	ΔTf (°C)	ΔTc (°C)	ΔTS (°C)	Mass loss (%)	Flame continuance (s)
1	94.5	18.7	103.8	30.1	1089
2	100.3	29.0	86.8	37.6	1204
3	112.1	28.2	107.3	36.8	1103
4	91.4	13.9	93.6	30.3	1041
5	97.8	17.5	112.7	29.7	1211
Average	99.2	21.5	100.8	32.9	1130

Remark: ΔTf -Temperature rise of the maximum furnace thermocouples above the final furnace temperature;

ΔTc -Temperature rise of the maximum specimen centre thermocouples above the final specimen centre temperature;

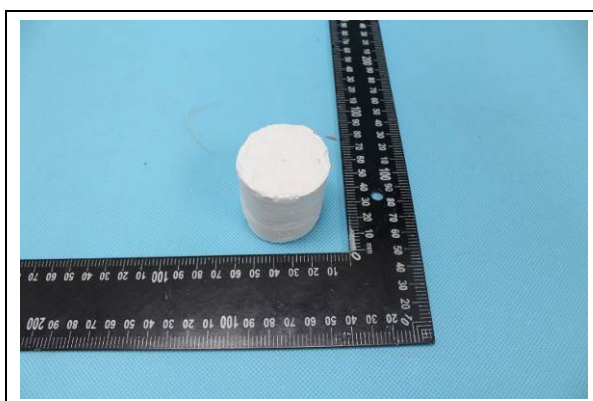
ΔTs -Temperature rise of the maximum specimen surface thermocouple above the final specimen surface temperature;

Mass Loss (%) =[initial mass (g) – mass after testing (g) ]/ initial mass (g)×100%;

Flame continuance (s): the total duration of sustained flaming.

### SAMPLE INFORMATION AND PICTURES

Actual size of Specimen: Height about: 53mm



\*\*\*\*\* End of report\*\*\*\*\*



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