TEST REPORT

No. : GZMR241003197201
Date : Nov 19, 2024

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CUSTOMER NAME: SHANDONG AT NEW MATERIAL AND TECHNOLOGY CO.,LTD.
ADDRESS: YINSHAN ROAD,JINSHAN INDUSTRIAL PARK,HI-TECH DISTRICT,LINYI CITY ,SHANDONG PROVINCE,China

Sample Name	:	Roller coated color aluminum plate
Material and Mark	:	3003H24
Product specification	:	3.0
Others	:	PVDF fluorocarbon coating,Primer 8 μ m, intermediate coat 18μm, top coat 15 μ m

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.	:	QDIN2410002077PL01
Date of Receipt	:	Oct 28, 2024
Testing Start Date	:	Oct 28, 2024
Testing End Date	:	Nov 19, 2024
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)

Signed for
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Cathy Peng
Authorized signatory

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Laboratory

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TEST REPORT

No. : GZMR241003197201
Date : Nov 19, 2024

Summary of Results:

No.	Test Item	Test Method	Result	Conclusion
1	Color Uniformity	AAMA 2605-22 Section 5.7, Section 8.1 & ASTM D2244-23	ΔE_H=0.3	Pass
2	Dry Film Hardness	AAMA 2605-22 Section 8.3 & ASTM D3363-22	F	Pass
3	Dry Adhesion	AAMA 2605-22 Section 8.4.2.1 & ASTM D3359-23 Method B	Adhesion classification：5B	Pass
4	Boiling Water Adhesion	AAMA 2605-22 Section 8.4.2.2, Section 8.4.2.1 & ASTM D3359-23 Method B	Adhesion classification：5B	Pass
5	Muriatic Acid Resistance	AAMA 2605-22 Section 8.7.1	No blistering or other visual change	Pass
6	Mortar Resistance	AAMA 2605-22 Section 8.7.2	No loss of adhesion or any other visual change	Pass
7	Detergent Resistance	AAMA 2605-22 Section 8.7.4	No loss of film adhesion, no blistering or other visual change in appearance	Pass
8	Wet Adhesion	AAMA 2605-22 Section 8.4.2.3, Section 8.4.2.1 & ASTM D3359-23 Method B	Adhesion classification：5B	Pass
9	Window Cleaner Resistance	AAMA 2605-22 Section 8.7.5	No blistering or other visual change in appearance, no removal of film	Pass

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检验检测专用章 Inspection & Testing Services

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10	Impact Resistance	AAMA 2605-22 Section 8.5	No visual cracking, no removal of film	Pass
11	Specular Gloss	AAMA 2605-22 Section 8.2 & ASTM D523-14(2018)	30	Pass
12	Nitric Acid Resistance	AAMA 2605-22 Section 8.7.3	ΔE_H: 0.3	Pass
13	Flexibility of Coating	AAMA 2605-22 Appendix A5.1 & ASTM D4145-10(2022)	0T, no cracking or flaking	Pass

Note: Pass : Meet the requirements;
Fail : Does not meet the requirements;
/ : Not Apply to the judgment.

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TEST REPORT

1.Test Item: Color Uniformity

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 5.7, Section 8.1 & ASTM D2244-23

Test Condition:

Sphere spectrophotometer d/8

Illuminant: D65

Observer: 10°

Aperture diameter: 25mm

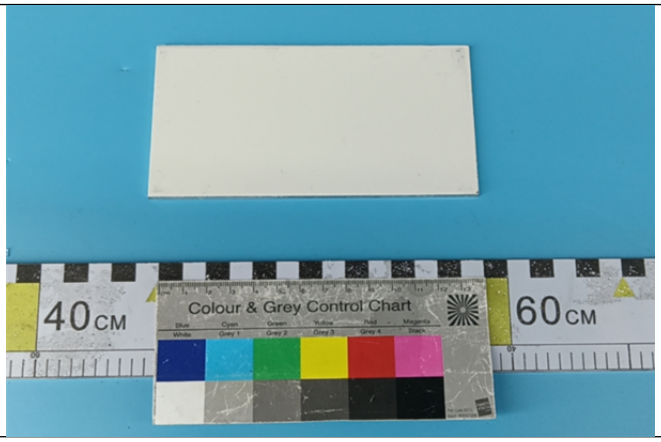
Test mode: Specular Component Included

Test Result:

Test Item	ΔE_H	Requirement in AAMA 2605-22 Section 8.1.3	Conclusion
Color Uniformity	0.3	$\Delta E_H \leqslant 2.0$	Pass

Note: According to client's requirement, use any one sample as the standard sample to calculate ΔE_H.

Test Photo:



Original Sample-Sample A

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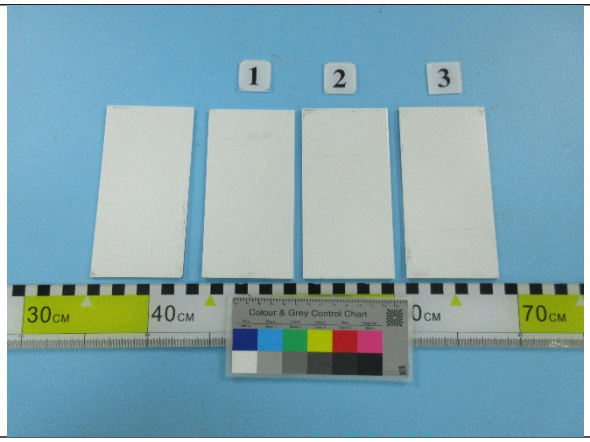
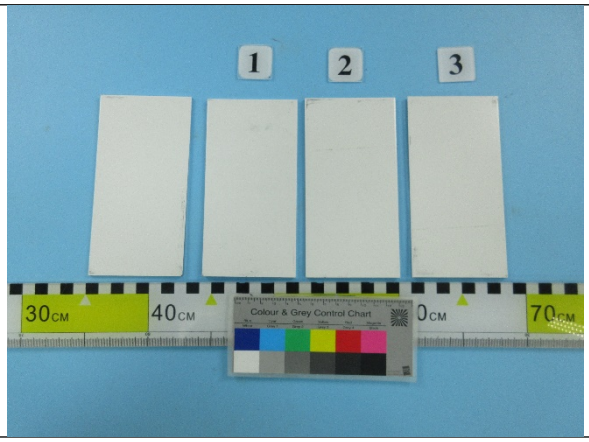
TEST REPORT

	
Standard sample Test sample Before Test-Sample A	Standard sample Test sample After Test-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Sphere Spectrophotometer	Ci7800	GZMR-AG-E307	2024-01-29	2025-01-28

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2. Test Item: Dry Film Hardness

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.3 & ASTM D3363-22

Test Condition:

Pencil：Mitsubishi® Uni

Test Result:

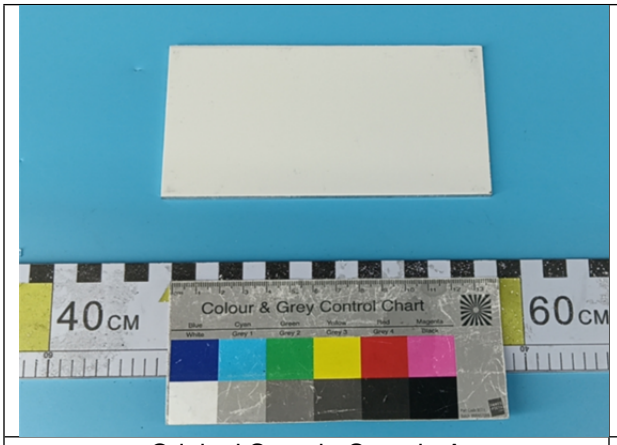
Test Item	Result	Requirement in AAMA 2605-22 Section 8.3.3	Conclusion
Dry Film Hardness	F	≥F	Pass

Note:According to ASTM D3363-22, 6H is the hardest and 6B is the softest.

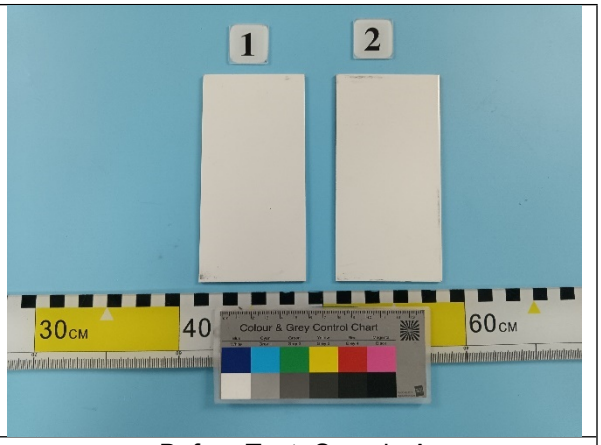
6B－5B－4B－3B－2B－B－HB－F－H－2H－3H－4H－5H－6H

Softer←----------→Harder

Test Photo:



Original Sample-Sample A



Before Test -Sample A

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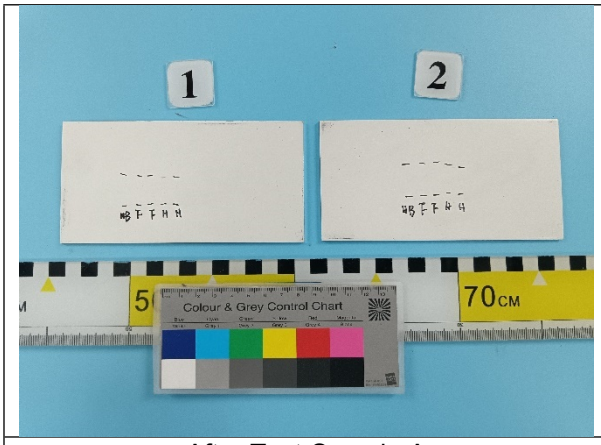	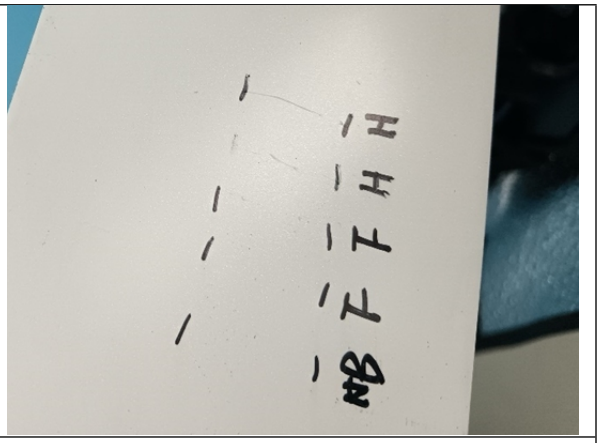
After Test-Sample A	After Test-Local-Sample A

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TEST REPORT

3. Test Item: Dry Adhesion

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.4.2.1 & ASTM D3359-23 Method B

Test Condition:

Space: 1mm

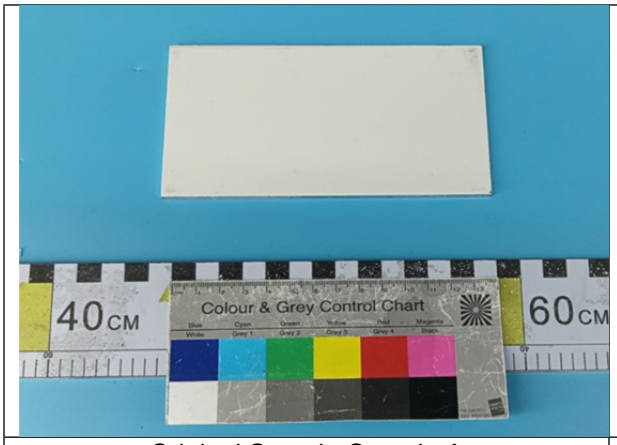
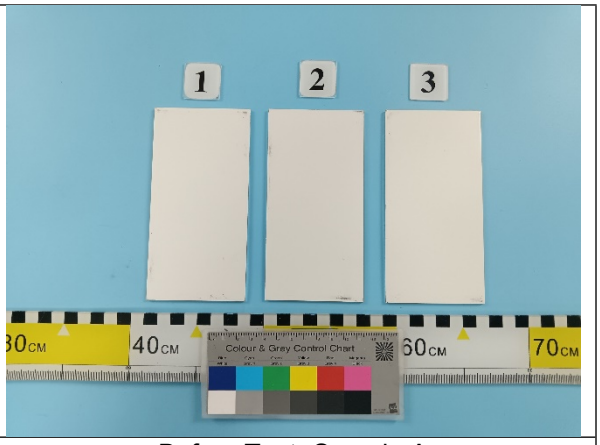
Tape: Elcometer 99

Test Result:

Test Item	Adhesion classification	Requirement in AAMA 2605-22 Section 8.4.3.2	Conclusion
Dry Adhesion	5B	≥4B	Pass

Note: According to ASTM D3359-23 Method B, in the adhesion classification-- 5B is the best, 0B is the worst.

Test Photo:

	
Original Sample-Sample A	Before Test -Sample A

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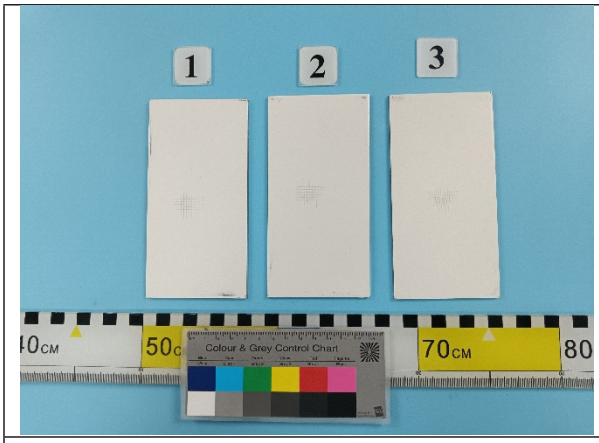	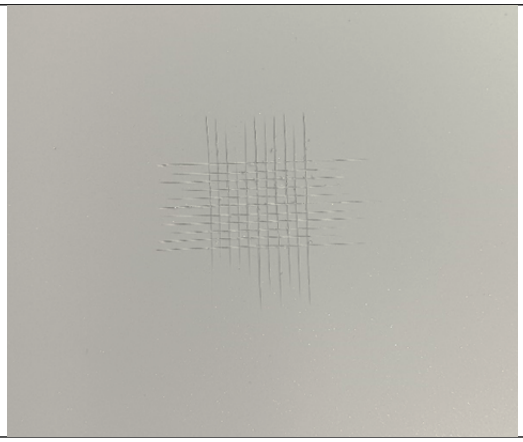
After Test-Sample A	After Test-Local-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Coating Thickness Gauge	DUALSCOPE FMP40+FD10	GZMR-AG-E312	2023-12-22	2024-12-21
Cross Rules	BEVS 2203/1C	GZMR-AG-E036-14	2024-07-25	2025-07-24

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TEST REPORT

4. Test Item: Boiling Water Adhesion

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.4.2.2, Section 8.4.2.1 & ASTM D3359-23 Method B

Test Condition:

Cut space: 1mm

Immersed in boiling water for 20min

Tape: Elcometer 99

Test Result:

Test Item	Adhesion classification	Requirement in AAMA 2605-22 Section 8.4.3.2	Conclusion
Boiling Water Adhesion	5B	≥4B	Pass

Note: According to ASTM D3359-23 Method B, in the adhesion classification-- 5B is the best, 0B is the worst.

Test Photo:



Original Sample-Sample A



Before Test -Sample A

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	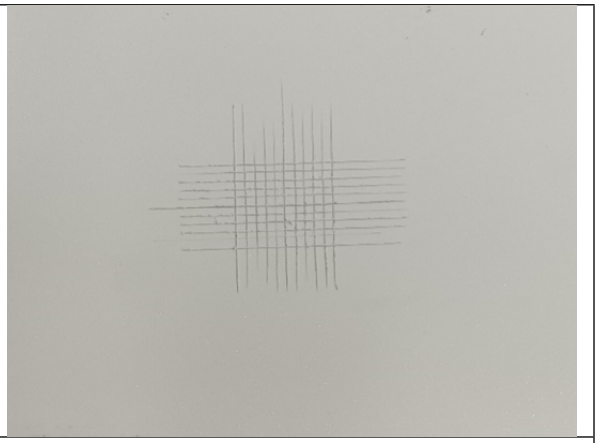
After Test-Sample A	After Test-Local-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Coating Thickness Gauge	DUALSCOPE FMP40+FD10	GZMR-AG-E312	2023-12-22	2024-12-21
Cross Rules	BEVS 2203/1C	GZMR-AG-E036-14	2024-07-25	2025-07-24

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TEST REPORT

5. Test Item: Muriatic Acid Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.7.1

Test Condition:

Medium: 10%(V/V) HCl

Method: Spot method

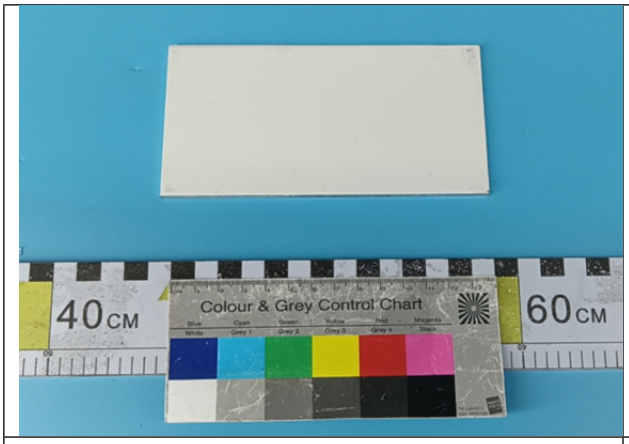
Temperature: 18℃~27℃

Duration: 15min

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-22 Section 8.7.1.3	Conclusion
Muriatic Acid Resistance	No blistering or other visual change	No blistering and no visual change in appearance	Pass

Test Photo:



Original Sample-Sample A



Reference sample Test sample

Before Test-Sample A

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TEST REPORT

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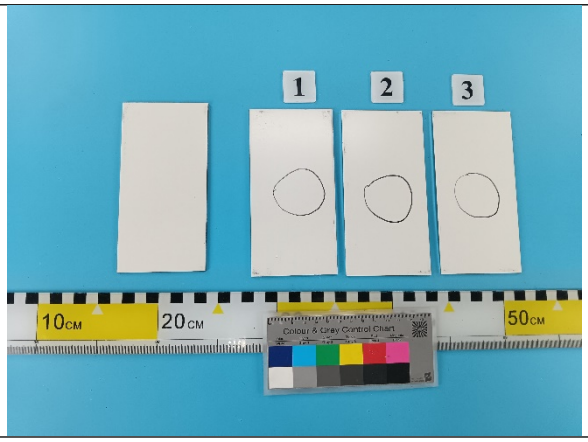
Date : Nov 19, 2024



Reference sample Test sample

After Test-Sample A

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TEST REPORT

6. Test Item: Mortar Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.7.2

Test Condition:

Temperature: 38℃

Humidity: 100%RH

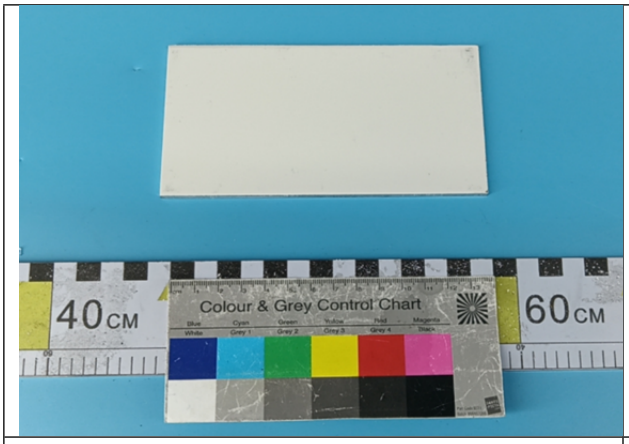
Exposure period: 24h

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-22 Section 8.7.2.3	Conclusion
Mortar Resistance	No loss of adhesion or any other visual change	No loss of film adhesion or visual change in appearance	Pass

Note: The mortar composition is as follows: Building lime: 75g; Dry sand: 225g; Water: 100g.

Test Photo:



Original Sample-Sample A



Reference sample Test sample

Before Test-Sample A

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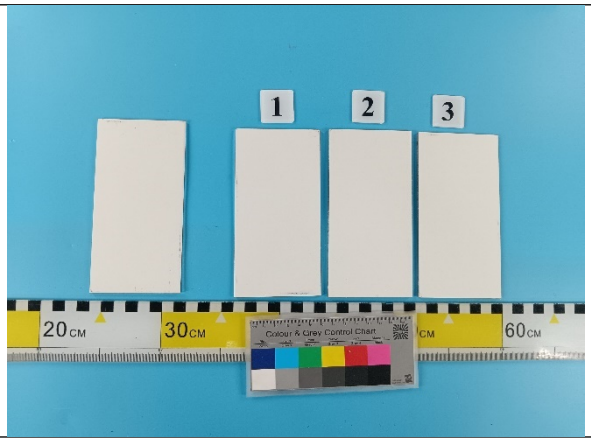

Reference sample Test sample

After Test-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electron balance	JJ2000B	GZMR-AG-E308	2024-03-28	2025-03-27
Condensation Test Chamber	TG-2100-M	GZMR-AG-E130	2024-04-15	2025-04-14

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TEST REPORT

7.Test Item: Detergent Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.7.4

Test Condition:

Method: Immersion method

Temperature: 38℃

Duration: 72h

Tape: Elcometer 99

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-22 Section 8.7.4.3	Conclusion
Detergent Resistance	No loss of film adhesion, no blistering or other visual change in appearance	No loss of adhesion of the film, no blistering and no significant visual change in appearance	Pass

Note: The solid detergent composition is as follows:

Tetrasodium pyrophosphate ($Na_4P_2O_7$, AR), anhydrous: 53% (m/m)

Sodium sulfate (Na_2SO_4, AR), anhydrous: 19% (m/m)

Sodium metasilicate (Na_2SiO_3, AR), anhydrous: 7% (m/m)

Sodium carbonate (Na_2CO_3, AR), anhydrous: 1% (m/m)

Dodecylbenzenesulfonic acid, sodium salt (AR): 20% (m/m)

Prepare a 3% (m/m) solution of detergent with the solid detergent.

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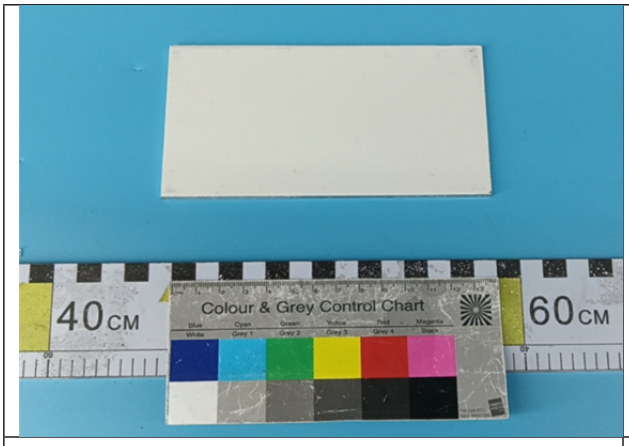
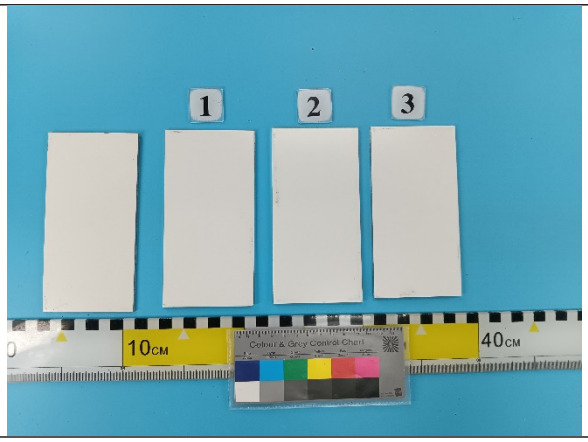
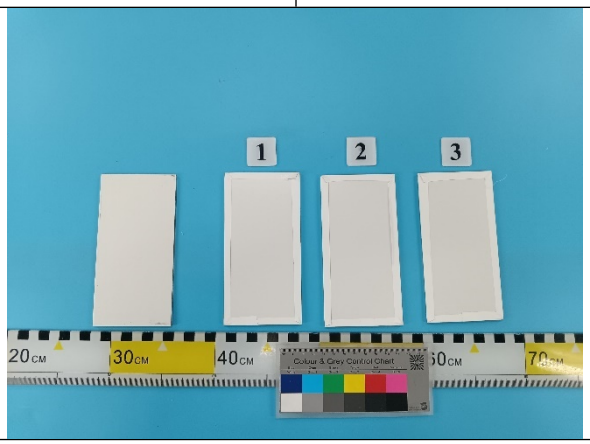
Test Photo:



Original Sample-Sample A



Reference sample Test sample
Before Test-Sample A



Reference sample Test sample
After Test-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electron balance	JJ2000B	GZMR-AG-E308	2024-03-28	2025-03-27
Constant temperature water tank	BK610C	GZMR-PL-E420	2024-01-18	2025-01-17

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8. Test Item: Wet Adhesion

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.4.2.3, Section 8.4.2.1 & ASTM D3359-23 Method B

Test Condition:

Cut space: 1mm

Immersed in 38℃ water for 24h

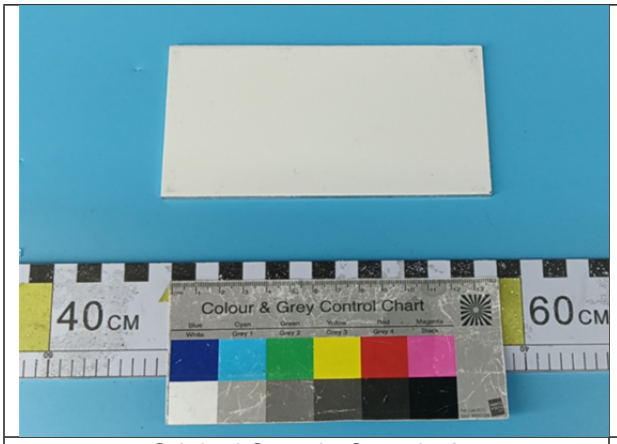
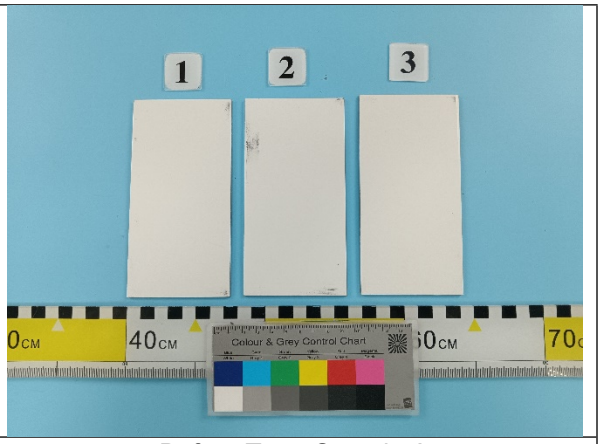
Tape: Elcometer 99

Test Result:

Test Item	Adhesion classification	Requirement in AAMA 2605-22 Section 8.4.3.2	Conclusion
Wet Adhesion	5B	≥4B	Pass

Note: According to ASTM D3359-23 Method B, in the adhesion classification-- 5B is the best, 0B is the worst.

Test Photo:

	
Original Sample-Sample A	Before Test -Sample A

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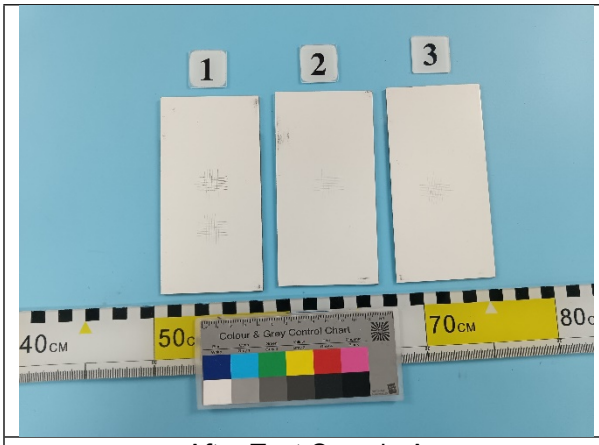	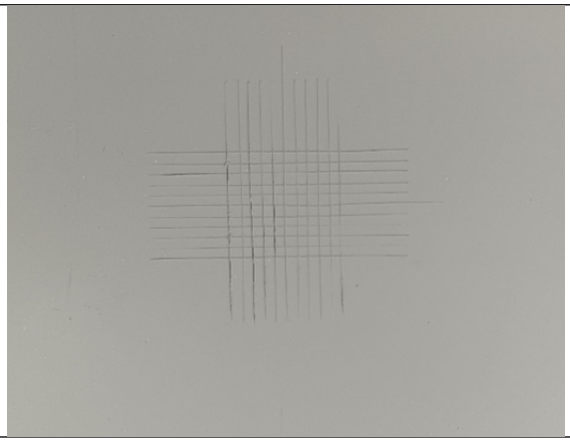
After Test-Sample A	After Test-Local-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Coating Thickness Gauge	DUALSCOPE FMP40+FD10	GZMR-AG-E312	2023-12-22	2024-12-21
Cross Rules	BEVS 2203/1C	GZMR-AG-E036-14	2024-07-25	2025-07-24
Constant temperature water tank	BL810C-T02	GZMR-AG-E289	2024-08-15	2025-08-14

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TEST REPORT

9.Test Item: Window Cleaner Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.7.5

Test Condition:

Method: Spot method

Temperature: 18℃~27℃

Duration: 24h

Dry adhesion test:

Space: 1mm

Tape: Elcometer 99

Test Result:

Test Item	Test Result	Requirement in AAMA 2605-22 Section 8.7.5.3	Conclusion
Window Cleaner Resistance	No blistering or other visual change in appearance, no removal of film	No blistering or noticeable change in appearance, no removal of film	Pass

Note: The window cleaner composition is as follows:

Propylene glycol methyl ether (AR): 5% (m/m)

Propylene glycol (AR): 5% (m/m)

Isopropanol(AR): 35% (m/m)

Water: 55%(m/m)

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TEST REPORT

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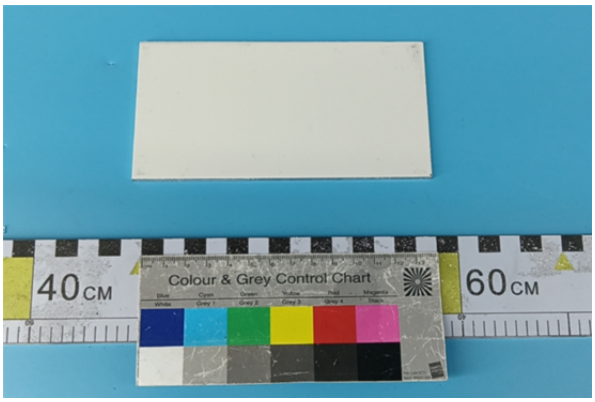
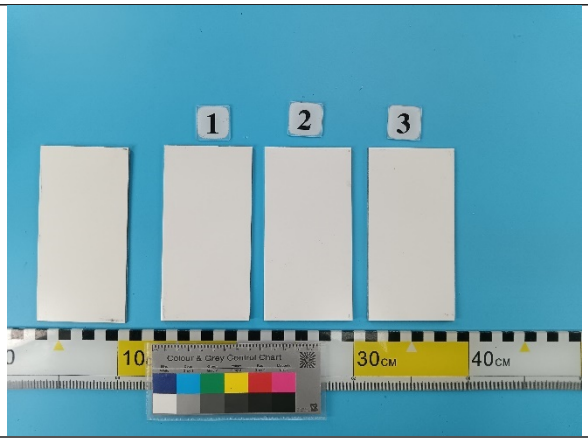
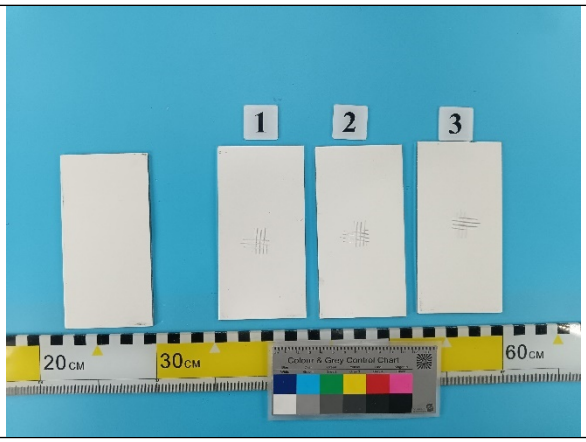
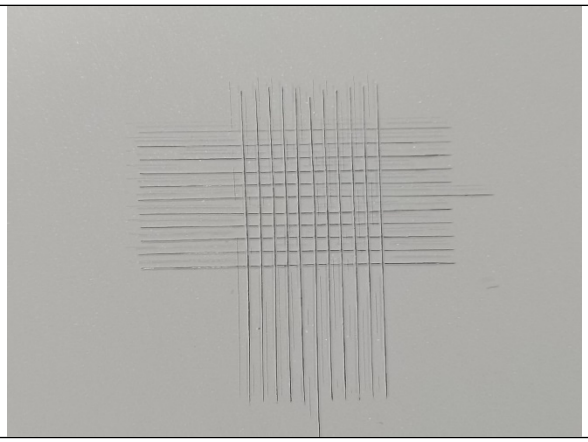
Date : Nov 19, 2024

Test Photo:

	
Original Sample-Sample A	Reference sample Test sample Before Test-Sample A
	
Reference sample Test sample After Test-Sample A	After Test-Sample A-Local part

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TEST REPORT

No. : GZMR241003197201
Date : Nov 19, 2024

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Electron balance	JJ2000B	GZMR-AG-E308	2024-03-28	2025-03-27
Coating Thickness Gauge	DUALSCOPE FMP40+FD10	GZMR-AG-E312	2023-12-22	2024-12-21
Cross Rules	BEVS 2213/1C	GZMR-AG-E036-20	2024-07-04	2025-07-03

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TEST REPORT

10.Test Item: Impact Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.5

Test Condition:

Diameter of the punch: 16mm

Impact type: Intrusion

Tape: Elcometer 99

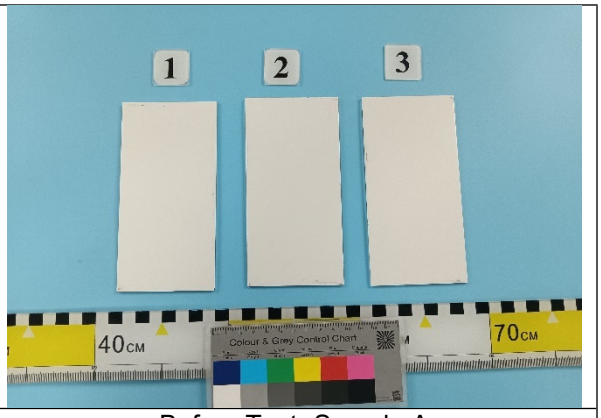
Test Result:

Test Item	Test result	Requirement in AAMA 2605-22 Section 8.5.3	Conclusion
Impact Resistance	No visual cracking, no removal of film	No coating peeling off	Pass

Test Photo:



Original Sample-Sample A



Before Test -Sample A

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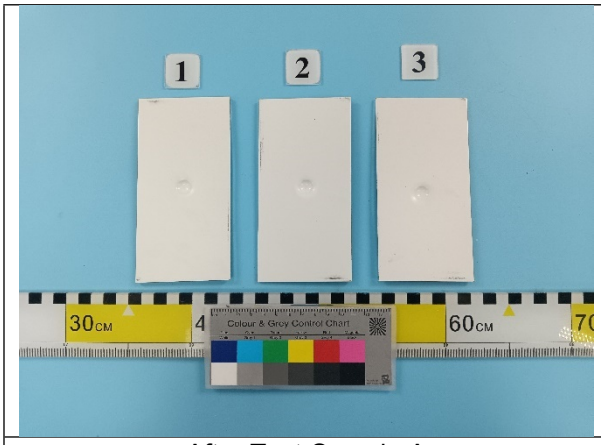	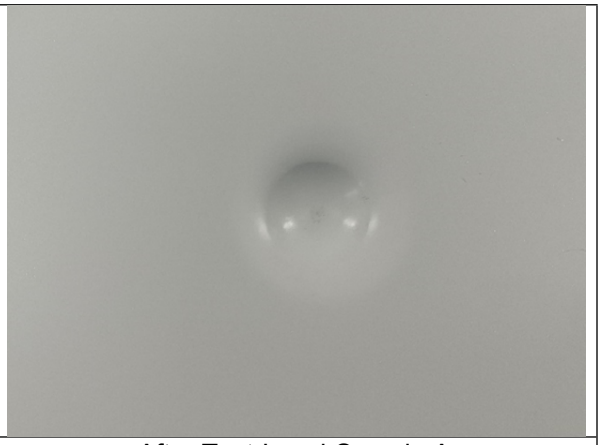
After Test-Sample A	After Test-Local-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Digital Vernier Caliper	CD-20AX	GZMR-AG-E128-02	2024-06-07	2025-06-06
Impact Tester	IG-1121	GZMR-AG-E004	2024-01-17	2025-01-16

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TEST REPORT

11.Test Item: Specular Gloss

Sample Description: Coating panel

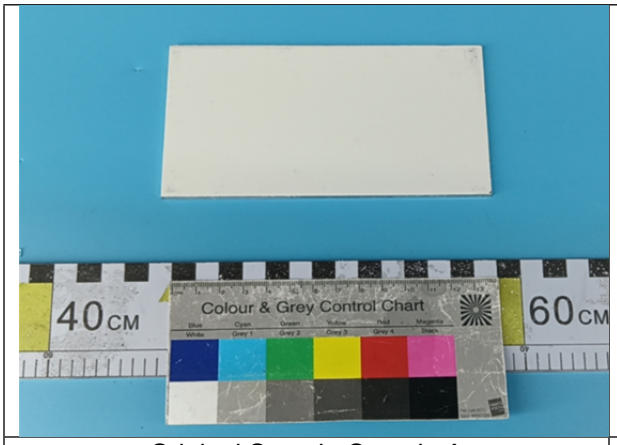
Test Method: AAMA 2605-22 Section 8.2 & ASTM D523-14(2018)

Test Condition: 60° geometry

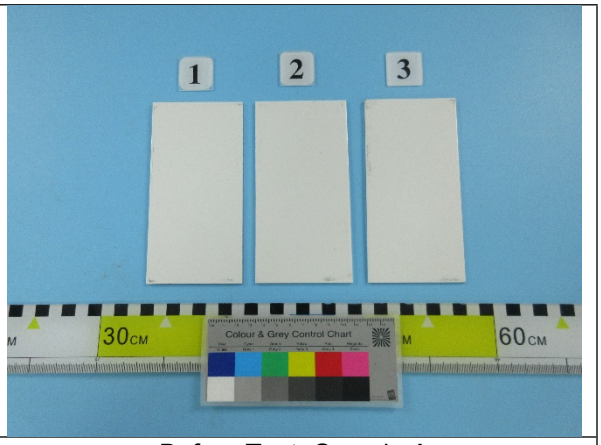
Test Result:

Test Item	Test Result	Requirement in AAMA 2605-22 Section 8.2.3	Conclusion
Specular Gloss	30	29(Provided by client)±5	Pass

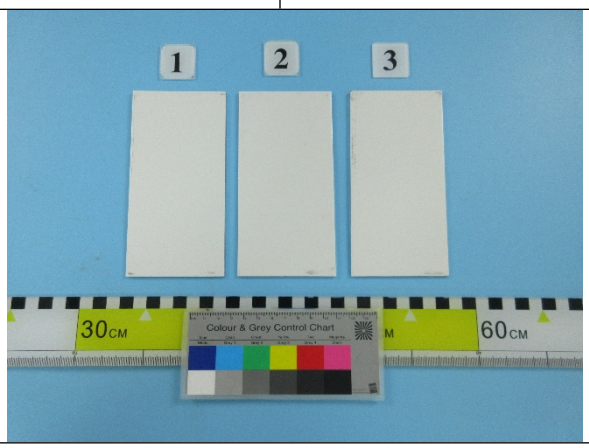
Test Photo:



Original Sample-Sample A



Before Test -Sample A



After Test-Sample A

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TEST REPORT

No. : GZMR241003197201
Date : Nov 19, 2024

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Specular Gloss Meter	4446	GZMR-AG-E119	2024-04-23	2025-04-22

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TEST REPORT

12.Test Item: Nitric Acid Resistance

Sample Description: Coating panel

Test Method: AAMA 2605-22 Section 8.7.3

Test Condition:

Medium: 70% (m/m) Nitric acid

Temperature: 18℃~27℃

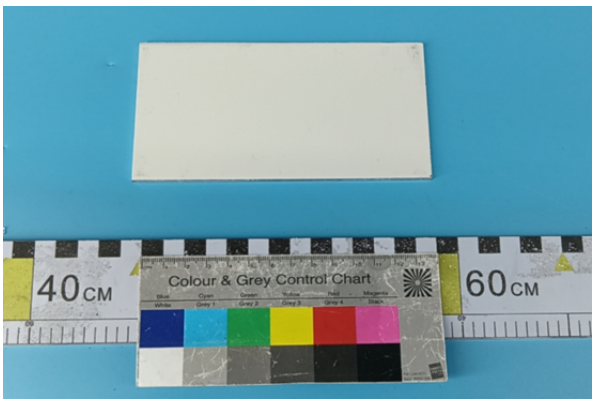
Duration: 30min

Test Result:

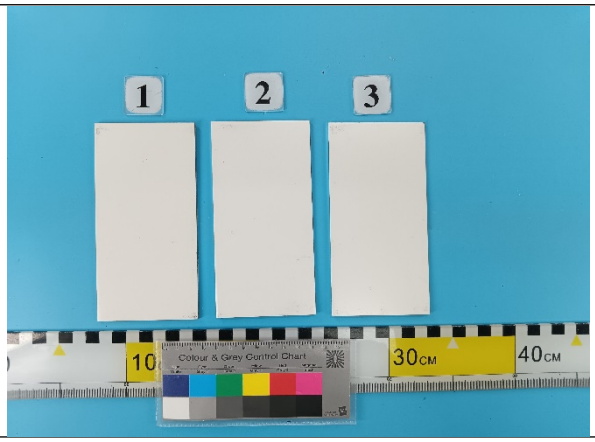
Test Item	ΔE_H	Requirement in AAMA 2605-22 Section 8.7.3.3	Conclusion
Nitric Acid Resistance	0.3	$\Delta E_H \leqslant 5$	Pass

Note: ΔE_H was measured by sphere spectrophotometer and under D65 standard light source with 10° observer. The results include specular reflection condition, 25mm aperture.

Test Photo:



Original Sample-Sample A



Before Test-Sample A

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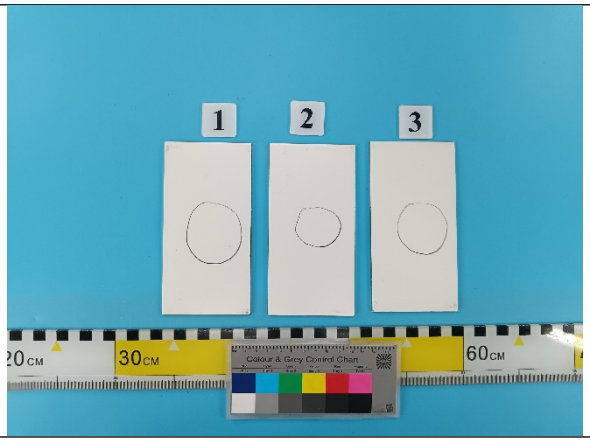

After Test-Sample A

Equipment Information:

Equipment	Model	Equipment No.	Calibration date	Next Calibration date
Sphere Spectrophotometer	Ci7800	GZMR-AG-E307	2024-01-29	2025-01-28

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TEST REPORT

13.Test Item: Flexibility of Coating

Sample Description: Coating panel

Test Method: AAMA 2605-22 Appendix A5.1 & ASTM D4145-10(2022)

Test Condition:

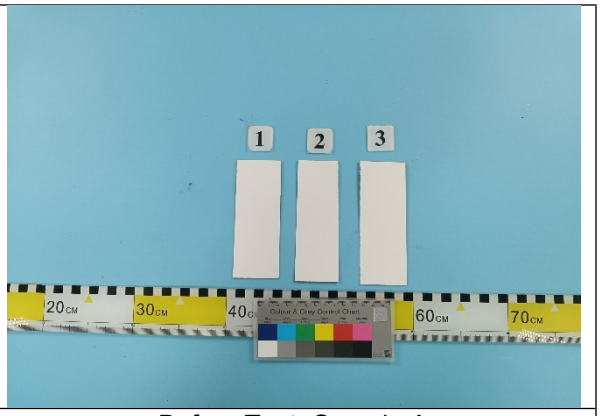
T-Bend

Tape: Elcometer 99

Test Result:

Test Item	Result	Requirement in AAMA 2605-22 Appendix A5.1.2	Conclusion
Flexibility of Coating	0T, no cracking or flaking	There shall be a minimum of 2-T flexibility with no pick-off at the area of the bend	Pass

Test Photo:

	
Original Sample-Sample A	Before Test -Sample A

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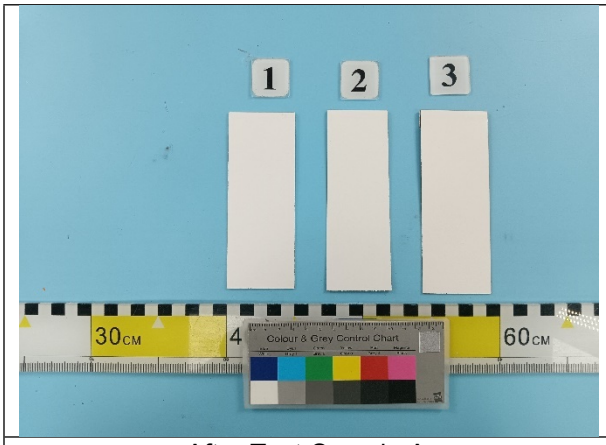
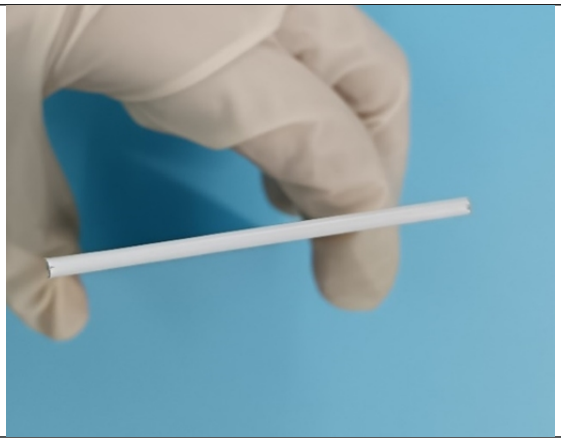
TEST REPORT

	
After Test-Sample A	After Test-Local-Sample A

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

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