Test Report Number: GZHH00488894

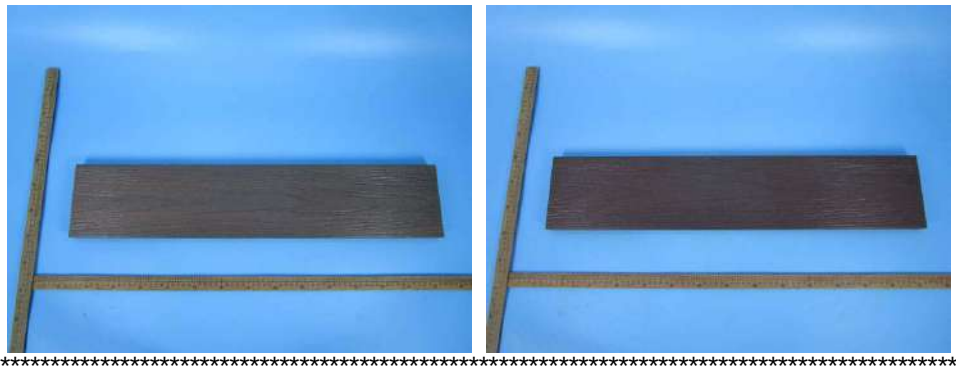
Applicant: HUANGSHAN HUASU NEW MATERIAL SCIENCE & TECHNOLOGY CO LTD
CHENGBEI INDUSTRIAL ZONE, HUIZHOU DISTRICT, HUANGSHAN CITY, ANHUI PROVINCE, CHINA.

Date: Jul 21, 2023

Sample Description:

One (1) group of submitted sample said to be :

Item Name	:	**Co-Extrusion Composite Decking**
Item No.	:	**138S23-K**
Manufacturer	:	Huangshan Huasu New Material Science & Technology Co Ltd
Date Sample Received	:	Apr 13, 2023 & Jun 26, 2023
Testing Period	:	Apr 13, 2023 to Jul 20, 2023



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Tests conducted:

As requested by the applicant, refer to attached page(s) for details.

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To be continued

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Conclusion:

Tested sample	Test Item	Result
Submitted samples	Density - As per the client's requirement, with reference to ASTM D792-20	See test conducted
	Brinell hardness test - As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.5	See test conducted
	Impact resistance- Solid profiles test - As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.1.2.1	See test conducted
	Creep-Recovery - As per the client's requirement, with reference to ASTM D7032-21 Section 5.4	See test conducted
	Concentrated actions - As per the client's requirement, with reference to AS/NZS 1170.1: 2002 Section 3.4 Concentrated actions	See test conducted
	Uniformly distributed actions - As per the client's requirement, with reference to AS/NZS 1170.1: 2002 Section 3.4 Uniformly distributed actions	See test conducted
	Slip resistance (Oil-wet inclining platform test) - As per the client's requirement, with reference to AS 4586:2013 slip resistance classification of new pedestrian surface materials: Appendix D	See test conducted
	Slip resistance (Wet pendulum test) - As per the client's requirement with reference to AS 4586:2013 slip resistance classification of new pedestrian surface materials: Appendix A	See test conducted
	UV Exposure Test - As per the client's requirement, with reference to ASTM G154-23 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Materials – Cycle 1	See test conducted

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To be continued

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Conclusion:

Tested sample	Test Item	Result
Submitted samples	Water Absorption and Thickness Swelling - As per the client's requirement, with reference to ASTM D1037-12(2020) Section 23 Method B	See test conducted
	Thermal Expansion - As per the client's requirement, with reference to ASTM D7031-11(2019) Section 5.18 and ASTM D1037-12(2020) Section 24	See test conducted
	Fire Classification Test on Board - As per the client`s requirement, with reference to EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests	See test conducted

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Authorized by:
For Intertek Testing Services Shenzhen Ltd.
Guangzhou Branch, Hardlines

Victor T.J. Wang
Assistant General Manager

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Tests Conducted

1 Density

As per the client's requirement, with reference to ASTM D792-20, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Density	Test method: As per the client's requirement, with reference to ASTM D792-20 Distilled water, 23±2°C	1307 kg/m^3

2 Brinell hardness test

As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.5, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Brinell hardness test	Test method: As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.5 Specimen size: 51mm×51mm×23.3mm Steel spherical diameter: 10mm Loading: Increase the force to 2KN within 30±5s and maintain the force for 25s.	HB: 52.2 N/mm^2

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Tests Conducted

3 Impact resistance- Solid profiles test

As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.1.2.1, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Impact resistance- Solid profiles test	Test method: As per the client's requirement, with reference to EN 15534-1: 2014+A1: 2017 Section 7.1.2.1 Specimen: 312mm×140mm×23.3mm Weight of steel ball: 1000g Diameter of steel ball: 50mm Falling height: 700mm Span: 200mm	No Crack

4 Creep-Recovery

As per the client's requirement, with reference to ASTM D7032-21 Section 5.4, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Creep-Recovery	Test method: As per the client's requirement, with reference to ASTM D7032-21 Section 5.4 Specimen: 500mm×140mm×23.3mm Load span: 123 mm Support span: 369 mm Condition: 894N, 24h → recover with no load for 24 h	81.6%

Note: 1. Total deflection is deflection after application of load for 24h.
2. Residual deflection is deflection after the 24h recovery period.
3. Percent recovery, %= (Total deflection- Residual deflection) /Total deflection×100.

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Tests Conducted

5 Concentrated actions

As per the client's requirement, with reference to AS/NZS 1170.1: 2002 section 3.4 Concentrated actions, the submitted samples were subjected to the following tests.

Sample description: Board

Initial inspection: No any damage was found

Executive summary:

Test item	Test methods	Test result
Concentrated actions	Test standard: As per the client's requirement, with reference to AS/NZS 1170.1: 2002 Section 3.4 Concentrated actions Profile type: solid Specimen: 520mm×140mm×23.3mm Testing speed: 17.0mm/min; Span: 369mm; Conditioning and test conditions: 23±2°C, 50±5%RH	Concentrated actions: 29.2MPa

6 Uniformly distributed actions

As per the client's requirement, with reference to AS/NZS 1170.1: 2002 section 3.4 Uniformly distributed actions, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Uniformly distributed actions	Test method: As per the client's requirement, with reference to AS/NZS 1170.1: 2002 Section 3.4 Uniformly distributed actions Profile type: Solid floor Specimen size: 1508mm×140mm ×23.3mm Testing speed: 5mm/min Span: 450mm Conditioning and test conditions: 23±2°C, 50±5%RH.	See test data

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Tests Conducted

Test data:

Test No.	Load (kN)	Pressure (kPa)	Average Deflection (mm)	Failure Mode
1	4.0	20.0	0.65	No failure observed
2	6.0	30.0	0.92	No failure observed
3	8.0	40.0	1.19	No failure observed
4	10.0	50.0	1.46	No failure observed
5	12.0	60.0	1.74	No failure observed
6	14.0	70.0	2.03	No failure observed

Photo for reference:

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Tests Conducted

7 Slip resistance (Oil-wet inclining platform test)

As per the client's requirement, with reference to AS 4586:2013 slip resistance classification of new pedestrian surface materials: Appendix D, the submitted samples were subjected to the following tests:

Sample description: Board

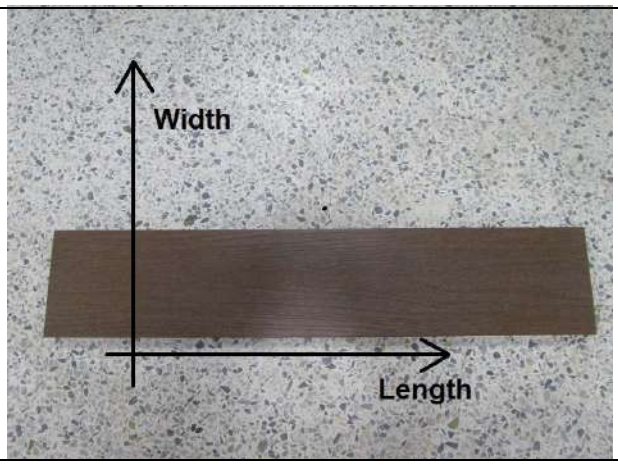
Initial inspection: No any damage was found

Sample size: 1005mm x 140mm x 23.3mm

Executive summary:

Test item	Classification of oil-wet inclining platform test		Test result
Slip resistance (Oil-wet inclining platform test)	Classification	Angle, degrees	Classification: R11 (Length direction: 19.5° Width direction: 23°)
	No classification	＜6°	
	R9	≥6° ＜10°	
	R10	≥10° ＜19°	
	R11	≥19° ＜27°	
	R12	≥27° ＜35°	
	R13	≥35°	

Photo for reference:



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Tests Conducted

8 Slip resistance (Wet pendulum test)

As per the client's requirement with reference to AS 4586:2013 slip resistance classification of new pedestrian surface materials: Appendix A, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found

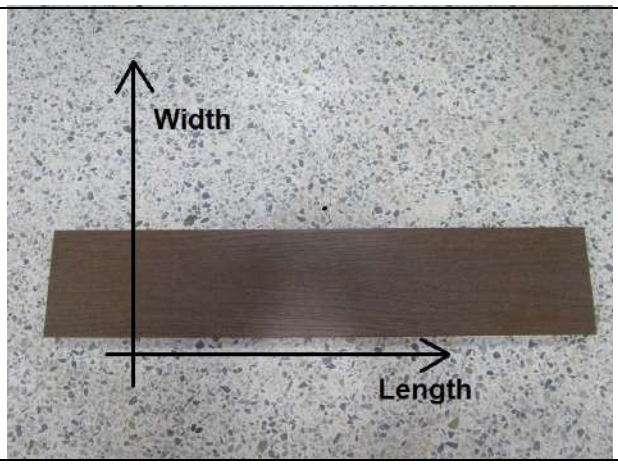
Sample size: 1005mm x 140mm x 23.3mm

Type of rubber slider: Slider 96

Executive summary:

Test item	Classification of wet pendulum test		Test result
Slip resistance (Wet pendulum test)	Classification	Pendulum SRV	Classification: Length direction: P4 (46 SRV); Width direction: P5 (55 SRV)
	P5	>54	
	P4	45-54	
	P3	35-44	
	P2	25-34	
	P1	12-24	
	P0	<12	

Photo for reference:



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Tests Conducted

9 UV Exposure Test

As per the client's requirement with reference to ASTM G154-23 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Materials – Cycle 1.

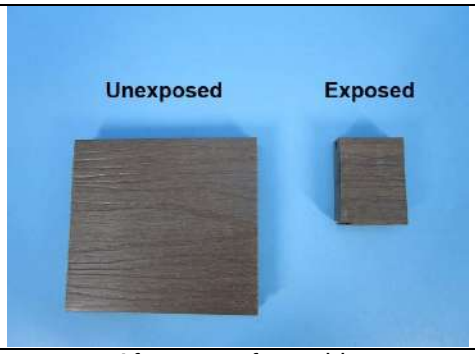
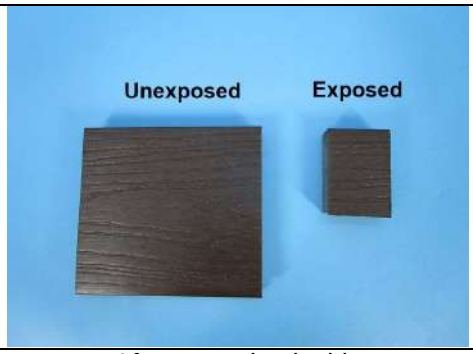
Operating conditions:
(1) Lamp = UVA-340.
(2) Typical irradiance = 0.89W/ (m^2.nm).
(3) Approximate wavelength = 340nm.
(4) Exposure cycle = 8 h UV at 60(+3)°C black panel temperature; 4 h condensation at 50(+3)°C black panel temperature.
(5) Exposure period = 2000hours.
Equipment: QUV chamber (model number: QUV/spray)

Assessment method:
Color change was assessed with reference to ISO 105-A02:1993 (grey scale).
Color difference was measured by the spectrophotometer.

Test surface	Grade of colorfastness (grey scale)	Colour difference	Appearance
Front side	4.5	ΔE =1.13	No blistering, no cracking
Back side	4.5	ΔE =2.16	No blistering, no cracking

Note: The grey scale was determined under the D65 standard light, the grade 5 is the best and the grade 1 is the worst.

Photos for reference:

	
After test – front side	After test – back side

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Tests Conducted

10 Water Absorption and Thickness Swelling

As per the client's requirement, with reference to ASTM D1037-12(2020) Section 23 method B, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Water Absorption and Thickness Swelling	Test method: As per the client's requirement, with reference to ASTM D1037-12(2020) Section 23 Specimen size: 152mm×140mm×23.3mm Water temperature: 20±1°C Test period: 24 hours.	Mean swelling: Length change: -0.1% Width change: 0.1% Thickness change: 0.2% Water absorption: 0.1%

11 Thermal Expansion

As per the client's requirement, with reference to ASTM D7031-11(2019) Section 5.18 and ASTM D1037-12(2020) Section 24, the submitted samples were subjected to the following tests:

Sample description: Board

Initial inspection: No any damage was found.

Executive summary:

Test item	Test methods	Test result
Thermal Expansion	Test method: As per the client's requirement, with reference to ASTM D7031-11(2019) Section 5.18 and ASTM D1037-12(2020) Section 24 Specimen: 305mm×140mm×23.3mm Conditioning: 20°C, 50% RH,48h→20°C 90% RH, 48h Lab Environment Condition: (23±2)°C，(50±5)%RH	Change rate in Length: 0.043% Change rate in Width: 0.036%

Note: Change rate ,%=(Value after condition – Value before condition)/ Value before condition×100.

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Tests Conducted

12 Fire Classification Test on Board

As per the client`s requirement, with reference to EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests, the submitted samples were subjected to the following tests.

Sample description: Board

Initial inspection: No any damage was found.

Test Conducted:
EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests. And the test methods as following:
EN ISO 9239-1:2010 Reaction to fire tests for floorings, Part 1: Determination of the burning behaviour using a radiant heat source.
EN ISO 11925-2:2020 Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test.

Mounting and fixing (For EN ISO 9239-1):
Fibre cement board density about 1800kg/m^3, thickness about 8mm, is as the substrate.
The specimens were fixed mechanically to the substrate.

Test Results:

Test methods	Parameter	Number of tests	Results
EN ISO 9239-1	Critical flux (kW/m^2)	3	4.7
	Smoke (%×minutes)		112.3
EN ISO 11925-2 Exposure = 15 s	Fs≤150mm within 20 s (Yes/No)	6	Yes

Remark：
Above value is the mean value for the critical flux (CHF) from the three same orientation specimens.

Classification and direct field of application
This classification has been carried out in accordance with EN 13501-1:2018

Classification:

Fire behaviour		Smoke production	
C_{fl}	—	s	1

Remark:
The classes with their corresponding fire performance are given in Table 2.

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Tests Conducted

Statement:
The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Table 2-Classes of reaction to fire performance for floorings

B_{fl}	EN ISO 9239-1 [e] and	Critical flux [f] ≥ 8,0 kW/m^2	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
C_{fl}	EN ISO 9239-1 [e] and	Critical flux [f] ≥ 4,5 kW/m^2	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
D_{fl}	EN ISO 9239-1 [e] and	Critical flux [f] ≥ 3,0 kW/m^2	Smoke production [g]
	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150mm within 20 s	-
E_{fl}	EN ISO 11925-2 [h]: Exposure = 15 s	Fs ≤ 150 mm within 20 s	-
F_{fl}	EN ISO 11925-2 [h]: Exposure = 15 s	Fs > 150 mm within 20 s	-

[e] Test duration = 30 min.
[f] Critical flux is defined as the radiant flux at which the flame extinguishes or the radiant flux after a test period of 30 min, whichever is the lower (i.e. the flux corresponding with the furthest extent of spread of flame).
[g] s1 = Smoke ≤ 750 % minutes;
s2 = not s1.
[h] Under conditions of surface flame attack and, if appropriate to the end use application of the product, edge flame attack

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End of report

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