TEST REPORT

Sample information:

Flooring, See the photograph.

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

Preconditioning: 23±2°C, 50±5%RH for a minimum of 24h

Test result(s):

Sample nominal size: 1524mm×182mm×5mm

No	Test item(s)	Test method(s)	Test condition	Test result(s)
1	Length	ASTM F3261-20 Section 7.2&7.4 & ASTM F2055-17	Specimen: 1524mm×182mm×5mm, 5pcs	Average: 1524mm(60.000in.) Tolerance: 0.0mm(0.000in.)
	Width			Average: 181.94mm(7.163in.) Tolerance: 0.00mm(0.000in.)
	Squareness			Deviation range: 0.00mm(0.000in.)~+0.10mm(+0.004in.)
2	Length	ASTM F2421-05(2011)	Specimen: 1524mm×182mm×5mm, 5pcs	Average: 1524mm(60.000in.) Tolerance: 0.0mm(0.000in.)
	Width			Average: 181.92mm(7.162in.) Tolerance: 0.00mm(0.000in.)
	Squareness			Deviation range: 0.00mm(0.000in.)~+0.10mm(+0.004in.)
3	Flatness	ASTM F3261-20 Section 7.2, 7.5, 7.6, 7.7 & ISO 24337:2019	Specimen: 1524mm×182mm×5mm, 5pcs	$F_{l\ concave}$ = -0.01% $F_{l\ convex}$ = +0.00% $F_{w\ concave}$ = -0.03% $F_{w\ convex}$ =no convex
	Openings			O_{avg} = 0.00 mm(0.000in.) O_M = 0.05 mm(0.002in.)
	Ledging			H_{avg} = 0.00 mm(0.000in.) H_M = 0.05 mm(0.002in.)

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No	Test item(s)	Test method(s)	Test condition	Test result(s)		
4	Thickness	ASTM F3261-20 Section 7.3.1 & ASTM F387-17	Specimen: 150mm×150mm×5mm, 5pcs	Average: 5.09mm(0.200in.) Deviation from nominal size: +0.07mm(+0.003in.) ~+0.12mm(+0.005in.)		
5	Thickness of wear layer	ASTM F3261-20 Section 4.1.2, 7.3.2 & ASTM F410-08(2017)	Specimen: 13mm×50mm×5mm, 5pcs	Average: 0.535mm(0.021in.) Maximum: 0.545mm(0.021in.) Minimum: 0.527mm(0.021in.)		
6	Residual Indentation	ASTM F3261-20 Section 8.1 & ASTM F1914-18	Specimen: 51mm×51mm×5mm, 3pcs Diameter of indenter: 6.35±0.0127mm Condition: 23±2°C, 50±5%RH, 24h →75±0.75 lb, 15min →Recovery time: 60min	0.04mm (0.002in.)	0.04mm (0.002in.)	0.04mm (0.002in.)
				Average: 0.04mm(0.002in.)		
7	Surface integrity	ASTM F3261-20 Section 8.2 & ASTM F1914-18	Specimen: 51mm×51mm×5mm, 3pcs Diameter of indenter: 4.521±0.0127mm Condition: 23±2°C, 50±5%RH, 24h →140±1 lb, 10min	No puncture through wear layer		
8	Dimensional stability (see note 2)	ASTM F3261-20 Section 8.3 & ASTM F2199-20	Specimens: 305mm×182mm×5mm, 3pcs Condition: 23±2°C, 50±5%RH, 24h →70°C, 360min→ 23±2°C, 50±5%RH, 24h	Average: Length Direction (X): 0.02% Width Direction (Y): 0.02%		
9	Curling (see note 3)			Average: $Curling_{value.}$: 0.27mm(0.011in.) $Curling_{max.}$: 0.40mm(0.016in.)		

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TEST REPORT

No	Test item(s)	Test method(s)	Test condition	Test result(s)		
10	Resistance to chemicals	ASTM F3261-20 Section 8.4 & ASTM F925-13(2020)	Specimen: 500mm×182mm×5mm, 1pc Condition: 23±2°C, 50±5%RH, 24h Drop Method, Cover, 60±1min	Rating 0: No change (see note 2) (see the Table 1)		
11	Resistance to heat	ASTM F3261-20 Section 8.5 & ASTM F1514-19	Specimen: 500mm×182mm×5mm, 3pcs Condition: 23±1°C, 50±5%RH, 24h →70±1°C, 7days→ 23±1°C, 50±5%RH, 1h	Average ΔE^*_{ab}: 0.81 Max ΔE^*_{ab}: 1.05 (see note 2)		
12	Static Load (Residual Indentation)	ASTM F3261-20 Section 8.7 & ASTM F970-17	Specimen: 60mm×60mm×5mm, 3pcs Diameter of indenter: 28.6mm Condition: 23±2°C, 50±5%RH, 24h →250lb, 24h →Recovery time: 24h	0.11mm (0.004in.)	0.07mm (0.003in.)	0.09mm (0.004in.)
				Average: 0.09mm (0.004in.)		
13	Thickness swell	ASTM F3261-20 Section 8.8	Specimen:150mm×150mm ×5mm, 4pcs	With backing:0.16% Without backing:0.09%		
14	Light Ageing Test-Xenon-arc Exposure	ASTM F1515-15 & ASTM F3261-20 section 8.6	/	See the Table 2		

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Note: 1. All test specimens were cut from the samples, see the photograph.
2. Sphere Spectrophotometer with an 8 mm diameter opening having a daylight light (D-65) sources that measure color in CIE L*, a*, b*, ΔE*ab using CIE 10° Standard Observer and Specular Included.
3. Dimensional stability, % = (The average final length – The average initial length)/The average initial length×100.
4. Curling, mm = Dimension after exposure to heat - Dimension before exposure to heat.
5. 1 in.=25.4 mm.
6. Standard requirement of ASTM F3261-20 for the test items:

Characteristic	Requirement	
	Residential	Commercial
Size, tolerance Up to 12 in.(305mm); >12in. ≤18in.(457mm) >18in.	 ±0.016in.(0.40mm) ±0.018in.(0.45mm) ±0.020in.(0.50mm)	 ±0.016in.(0.40mm) ±0.018in.(0.45mm) ±0.020in.(0.50mm)
Squareness	max 0.010 in.(0.25mm)	max 0.010 in.(0.25mm)
Size, tolerance Plank length, ≥24 in. (610mm) <48in. >48in. (1220mm)	 ±0.060in.(1.5mm) ±0.080in.(2mm)	 ±0.060in.(1.5mm) ±0.080in.(2mm)
Flatness, max, inches , max % width , max % length	F_w ± 0.008in. (0.2mm) for planks or tiles ≤9 in.(229mm) wide $F_{w\ concave}$ ≤0.15 % / $F_{w\ convex}$ ≤0.20 % for all other widths $F_{l\ concave}$ ≤0.15 % / $F_{l\ convex}$ ≤0.20 %	F_w ± 0.008in. (0.2mm) for planks or tiles ≤9 in.(229mm) wide $F_{w\ concave}$ ≤0.15 % / $F_{w\ convex}$ ≤0.20 % for all other widths $F_{l\ concave}$ ≤0.15 % / $F_{l\ convex}$ ≤0.20 %
Openings, avg / max, mm	O_{avg} ≤ 0.004 in. (0.1mm) / O_M ≤ 0.008 in. (0.2mm)	O_{avg} ≤ 0.004 in. (0.1mm) / O_M ≤ 0.008 in. (0.2mm)
Ledging, avg / max, mm	H_{avg} ≤ 0.004 in. (0.1mm) / H_M ≤ 0.006 in. (0.15mm)	H_{avg} ≤ 0.004 in. (0.1mm) / H_M ≤ 0.006 in. (0.15mm)
Thickness, product without foam with foam back layer	 as specified ±0.005 in.(0.13mm) as specified ±0.008 in.(0.20mm) min 0.080 in. (2.0mm)	 as specified ±0.005 in.(0.13mm) as specified ±0.008 in.(0.20mm) min 0.080 in. (2.0mm)
Residual indentation, in.	Avg. ≤ 0.007 in. (0.18 mm)	Avg. ≤ 0.007 in. (0.18 mm)
Surface integrity	No puncture through wear layer/décor layer into rigid core	No puncture through wear layer/décor layer into rigid core
Resistance to chemicals	No more than a slight change in surface dulling, surface attack, or staining	No more than a slight change in surface dulling, surface attack, or staining
Resistance to heat	ΔE < 8 avg, max	ΔE < 8 avg, max
Resistance to light	ΔE < 8 avg, max	ΔE < 8 avg, max

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Table 1: Resistance to Chemicals

No.	Reagents	Surface Dulling	Surface Attack	Color Change	Comments	ΔE^*_{ab}
1	White vinegar (5% acetic acid, AR)	0	0	0	no staining or other visible defects	0.26
2	Rubbing alcohol (70% isopropyl alcohol, AR)	0	0	0	no staining or other visible defects	0.12
3	White mineral oil (medicinal grade)	0	0	0	no staining or other visible defects	0.78
4	NaOH solution (5%, AR)	0	0	0	no staining or other visible defects	0.36
5	HCl solution (5%, AR)	0	0	0	no staining or other visible defects	0.22
6	H_2SO_4 solution (5%, AR)	0	0	0	no staining or other visible defects	0.41
7	Household ammonia solution (5% NH_4OH, AR)	0	0	0	no staining or other visible defects	0.24
8	Household bleach (5.25% NaClO AR)	0	0	0	no staining or other visible defects	0.24
9	Disinfectant—phenol type (5 % active phenol)	0	0	0	no staining or other visible defects	0.16
10	Kerosene	0	0	0	no staining or other visible defects	0.12
11	Olive oil	0	0	0	no staining or other visible defects	0.49
12	Unleaded gasoline	0	0	0	no staining or other visible defects	0.27

Note: Subjective category ratings will all utilize the same scale of 0-3 refer to ASTM F925-13(2020), as follows:

Rating	Appearance
0	no change
1	slight change
2	moderate change
3	severe change

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Table 2:

Test Item: Light Ageing Test-Xenon-arc Exposure

Sample Description: See photo

Test Method: ASTM F1515-15 & ASTM F3261-20 section 8.6

Test Condition:

Exposure cycle:

Irradiance: 0.30 W/(m^2·nm)@340 nm

Continuous light at (63±2) ℃ BPT, (50±10) %RH

Filter: Window

Exposure period: 300 h

Test Result:

Sample	ΔE^*_{ab} (see table 1)	Requirement in ASTM F3261-20 section 8.6	Conclusion
A	1.4	$\Delta E^*_{ab} \leq 8.0$	Pass

Note: ΔE^*_{ab} was measured by sphere spectrophotometer under D65 standard light source and with 10° observer. The results include specular component reflection condition, 8 mm aperture.

Table 1:

Sample	Exposure period	L *	a*	b*	ΔE^*_{ab}	Average of ΔE^*_{ab}
A-1	0 h	63.19	5.76	20.33	1.5	1.4
	300 h	64.14	5.06	21.22		
A-2	0 h	63.41	5.20	19.69	1.3	
	300 h	64.29	4.47	20.31		
A-3	0 h	66.03	5.33	20.57	1.3	
	300 h	66.89	4.49	21.03		

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TEST REPORT

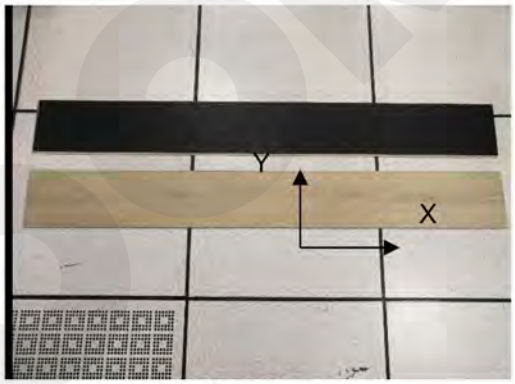
No. : XMIN2102001297CM
Date : Jul 23, 2021

Test Photo:

During test

Reference sample Tested sample

Specimen photograph(s):



Samples

Note: The test results were transferred from report No.: XMIN2102001293CM dated: Jul 23, 2021 issued by SGS.

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

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