

PRODUCT DESCRIPTION		
Size	Overall Thickness	5mm (including 1.0mm pre attached underlay)
Top layer	Type	Anti-bacterial, quartz enhanced UV cured coating
	Thickness	Wear layer of 0.55mm (22mil)
Core	Type	Waterproof thermoplastic composite
	Thickness	3.5mm
	Color	Black
	Density	≥ 1900kg/m <sup>3</sup>
	Wood content	None
Backing	Type	Natural cork
	Thickness	1mm
Bevel		Regular bevel
Locking system		Fall down (Tight lock)
Type of installation		Floating
Underfloorheating compatibility		Yes but under certain condition- See installation instruction manual
Material Type		Virgin material only

DIMENSIONAL TOLERANCE	
Thickness tolerance	+/- 0.2mm
Width tolerance	+/- 0.1mm
Length tolerance	+/- 0.5mm
Height difference	Handscraped texture ≤ 0.30mm, Others texture ≤ 0.15mm
Gap between planks	≤ 0.20mm
Cupping up	≤ 0.15% of the planks width
Cupping down	≤ 0.2% of the planks width
End lift	≤ 0.5% of the planks length
Bowing	≤ 1.0% of the planks length
Squareness	≤ 0.25mm/ 305mm

	Norm	Test method	Requirement	Test results	Conclusion
CHEMICAL COMPOSITION					
Formaldehyde emission	CARB	ASTM 6007	≤ 0.11 ppm	Not detected	Meet CARB phase 2 requirement
	EN 14041	EN 717-1	≤ 0.124 mg/m <sup>3</sup>	0.01	E0
VOC	Decret No2011-321	ISO 16000	TVOC<1000µg/m <sup>3</sup>	31	VOCA+
	DIBT	ISO 16000	TVOC<1000µg/m <sup>3</sup>	29	Meet AgBB requirement - U mark certified
	Floorscore	Californian 01350	Within CREL/TAC	Pass - TVOC =35	Floorscore certified (private label available under condition)
Ortho-phthalates	Prop 65	Spectrometry	Ortho-phthalate free	Not detected	Ortho-phthalate free, Comply with Prop 65
Lead	CPSIA	CPSC-CH-E-1002-08	≤ 90ppm	Not detected	Meet children toy regulation
PAHs	EU REACH regulation No.	Spectrometry and chromatography	<1mg/kg	0.7	Meet requirement of product that can be put in mouth
PCP	EN 14041	EN 12673	<1ppm	Not detected	Pass
Substances of Very High Concern (SVHC) (mercury, chromium VI, Cadmium, SCCp, benzene, Xylene, tributyltin, etc)	EU REACH regulation No. 1907/2006	Spectrometry and chromatography	≤ 0.1% (w/w)	Not detected	REACH compliant



SURFACE ANTIBACTERIAL PROPRIETY					
MRSA	-	Antimicrobacterial activity and efficacy	-	>99%	More than 99% bacteria reduction
ESBL	-		-	>99%	More than 99% bacteria reduction
E.Coli (Escherichia Coli)	-		-	>99%	More than 99% bacteria reduction
S.Aureus (Staphylococcus aureus)	-		-	>99%	More than 99% bacteria reduction



PHYSICAL PROPERTIES					
Heat exposure resistance 80° C/180° F	EN 16511	ISO 23999	$\Delta W/\Delta L \leq 0.25\%$	0.03%	Class 34, heavy commercial
	ASTM 1700	ASTM F2199	$\Delta W/\Delta L \leq 0.16\%$	0.03%	Pass
Dimensional variation (humidity change)	EN 16511	ISO 24339	$\Delta W/\Delta L \leq 0.15\%$	$\Delta W/\Delta L \leq 0.01\%$	Class 34, heavy commercial
Swelling after submersion in water	EN 16511	ISO 24336	$\leq 12\%$	0%	Class 34, heavy commercial
	NALFA LF 01-2011	NALFA LF 01-2011	$\leq 12\%$	0%	Class 4, heavy commercial
Impact sound transmission reduction	-	ASTM E492-09	ASTM E989-6	IIC=69	IIC=69
	-	ISO 10140-3	ISO EN 717-2	No data	No data
	-	ASTM E2179-9	ASTM E989-6	No data	No data
	-	ISO 10140-1	ISO EN 717-2	No data	No data
Airborne sound transmission reduction	-	ASTM E90-09	ASTM E413-16	STC=69	STC=69
	-	ISO 10140-2	ISO EN 717-1	No data	No data
Locking strength (23°C)	EN 16511	ISO 24334	Long side $\geq 2.0$ kN/m, Short side $\geq 3.5$ kN/m	Long side = 6.3 kN/m, Short side = 5.4 kN/m	Class 34, heavy commercial
Thermal conductivity	EN 14041	EN 12667	-	0.1 W/(m.k)	Suitable for underfloor heating system
Thermal resistance (R value)	-	EN 12667/ASTM C518	-	0.05 m <sup>2</sup> • K/W	Suitable for underfloor heating system
Reaction to fire	EN 14041	EN 13051-1	-	CHF=9.4kW/m <sup>2</sup>	Class Bfl -S1
Fire resistance (CHF)	-	ASTM E648/662	-	0.94 W/cm <sup>2</sup>	Class I

SURFACE PROPERTIES					
Wear resistance	-	ISO 1518-1	$\leq 0.015$ g/1000 rev	0.008	Pass
	EN 16511	EN 13329	$\geq 4000$ cycles	9600	Class 34, heavy commercial
	NALFA LF 01-2011	NALFA LF 01-2011	$\geq 6000$ cycles	9600	Class 4, heavy commercial
Scratch	-	ISO 1518-1	$\geq 2500$ g	3200g	Pass
Surface bonding	NALFA LF 01-2011	EN311/NALFA LF 01-2011	$\geq 1.5$ N/mm <sup>2</sup>	1.56 N/mm <sup>2</sup>	Class 4, heavy commercial
Static load	NALFA LF 01-2011	ASTM F970	$\geq 13.8$ Mpa (2000psi/450kg)	0.05mm - Pass	Class 4, heavy commercial
Residual indentation	ASTM F1700	ASTM F1914	$\leq 8\%$ (140 lbs/63kg)	1.90%	Pass
	EN 16511	EN 433/ISO 24343-1	$\leq 0.15$ mm	0.03	Class 34, heavy commercial
Impact resistance (big ball)	EN 16511	EN 13329	$\geq 1800$ mm	$\geq 1800$	IC3, Class 34, Heavy commercial
	NALFA LF 01-2011	NALFA LF 01-2011	$\geq 1400$ mm	$\geq 1400$	Class 4, heavy commercial
Impact resistance (small ball)	EN 13329	EN438	$\geq 15$ N	23	IC3, Class 34, Heavy commercial
	NALFA LF 01-2011	NALFA LF 01-2011	$\geq 500$ mm (19.7 in)	1000	Class 4, heavy commercial
Slipperiness	EN14041	EN 13893	DryCOF $\geq 0.3$	0.51	Class DS
	-	ASTM C1028	$\geq 0.5$	Dry: 0.8, Wet: 0.76	Meet ADA recommendation
	-	D 51130	$\geq R9$	R9	Anti-slip resistance R9 (stone embossed can reach R10)
Colour fastness to light	EN 13329	ISO 105-B02:1994, Method 3a	$\geq$ Grade 6	$\geq 6$	Pass
	NALFA LF 01-2011	NALFA LF 01-2011	Slight change only	Slight change only	Class 4, heavy commercial
Resistance to staining	EN 16511	EN 438-2	Group 1 and 2: grade 5, group3: grade 4	Group 1 and 2: grade 5, group3: grade 4	Class 33, Heavy commercial
	ASTM F1700	ASTM F925	Slight change only	Slight change only	Pass
	NALFA LF 01-2011	NALFA LF 01-2011	Slight change only	Slight change only	Class 4, heavy commercial

## LEED SCORECARD

LEED was developed to address all buildings everywhere, regardless of where they are in their life cycle. From hospitals to data centers, from historical buildings to those still in the design phase, there is a LEED certification program for every building. Our products will contribute value to a building's LEED v4 Scorecard in the following LEED certification program categories recognized by the USGBC as per following

LEED program certification	Category	Credit title	LEED points attainable	Credit description	How our product contribute to obtain LEED points
 <p><b>BD+C</b> Building Design and Construction</p> <p>Applies to buildings that are being newly constructed or going through a major renovation; includes New Construction, Core &amp; Shell, Schools, Retail, Hospitality, Data Centers, Warehouses &amp; Distribution Centers, and Healthcare</p>	Indoor Environmental Quality	Credit 1: Enhanced Indoor Air Quality Strategies - Option 2 Additional Enhanced IAQ Strategie - option D	1 point ID&C, 2 points Retail CI	To reduce concentrations of chemical that can damage air quality, human health, productivity, and the environment.	1. Formaldehyde emission are less than 0.05mg/m3, TVOCs are less than 0.5mg/m3. 2. The product is Floorscore certified.
		Credit 2: Low-Emitting Materials - Option1 Flooring	1 point		1. VOC emission are less than 0.5mg/m3. 2. The products is Floorscore certified.
		Credit 4: Indoor Air Quality Assessment - Option 2 Air Testing	2 points	To establish better quality indoor air in the building	1. Formaldehyde emission are less than 0.05mg/m3, TVOCs are less than 0.5mg/m3. 2. The product is Floorscore certified.
		Credit 9: Acoustic Performance	2 points	To provide effective acoustic design	The product has a high acoustic performance. IIC and STC test report are available on request
	Material & Resource	Credit 3: sourcing of raw material - Recycled Content - Option 2	1 point	Increase demand for building products that incorporate recycled content materials	The products has a Natural Cork Underlay pre attached. Natural cork underlay contains at least 95% pre-consumer content
		Credit 4: Material ingredient - Option 2	1 point	Minimize the use and generation of harmful substances	The product is 100% REACH compliant
		Credit 6 - PBT source reduction: lead, cadmium and copper	1 point	To reduce the release of persistent, bioaccumulative, and toxic chemicals	The product is free of lead, cadmium and copper
 <p><b>O+M</b> Building Operations and Maintenance</p> <p>Applies to existing buildings that are undergoing improvement work.</p>	Material & Resource	Credit 3: Purchasing - Facility maintenance and renovation	1 point	To reduce the environmental harm from materials used in building renovations	1. The product is 100% REACH compliant 2. Formaldehyde emission are less than 0.05mg/m3, TVOCs are less than 0.5mg/m3. 3. Test repost according to ISO 16000 is available on request. 3. The product is Floorscore certified.

LEED programm certification	Category	Credit title	LEED points attainable	Credit description	How our product contribute to obtain LEED points
 <p><b>Homes</b></p> <p>Applies to single family homes, low-rise multi-family (one to three stories), or mid-rise multi-family (four to six stories); includes Homes and Multifamily Lowrise and Multifamily Midrise</p>	Indoor Environmental Quality	Credit 2: Contaminant Control - Option 4 Air Testing	1 point	Demonstrate that contaminants do not exceed concentration levels listed	The products is Floorscore certified.
		Credit 7: Low-Emitting Materials	0.5 point	To reduce occupants' exposure to airborne chemical contaminants	The product is Floorscore certified and meet the requirements of CA Section 01350. The product is made with ULEF or non-added formaldehyde material
	Material & Resource	Prerequisite - Durability management	0 point (Prerequisite)	To promote durability and performance of the building	The product is water resistant
 <p><b>Interior Design and Construction</b></p> <p>Applies to projects that are a complete interior fit-out; includes Commercial Interiors, Retail and Hospitality</p>	Indoor Environmental Quality	Credit 1: Enhanced Indoor Air Quality Strategies - Option 2 Additional Enhanced IAQ Strategies - option D	1 point ID&C, 2 points Retail CI	To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and	1. Formaldehyde emission are less than 0.05mg/m3, TVOCs are less than 0.5mg/m3. 2. The product is Floorscore certified.
		Credit 2: Low-Emitting Materials - Option1 Flooring	1 point	To establish better quality indoor air in the building	1. VOC emission are less than 0.5mg/m3. 2. The products is Floorscore certified.
		Credit 4: Indoor Air Quality Assessment - Option 2 Air Testing	2 points	To provide workspaces and classrooms effective acoustic	1. Formaldehyde emission are less than 0.05mg/m3, TVOCs are less than 0.5mg/m3. 2. The product is Floorscore certified.
		Credit 9: Acoustic Performance	2 points	Minimize the use and generation of harmful substances	The product has a high acoustic performance. IIC and STC test report are available on request
	Material & Resource	Credit 4: Material ingredient - Option 2	1 point		The product is 100% REACH compliant

### WELL certified

The WELL Building Standard is founded on the understanding that facets of our environment interact with personal, genetic and behavioral factors to shape our overall health and

Feature 01. Air quality standards			
Requirement		Concept score	How our product contribute to obtain WELL level certification
Part 1. Standards For Volatile Substances	The following conditions are met: a. Formaldehyde levels less than 27ppb (0.027ppm)	PRECONDITION	a. Formaldehyde emission are less than 0.05mg/m3.
	b. Total volatile organic compounds less than 500ug/m3 (0.5mg/m3)		b. The total volatile organic compounds are less than 0.5mg/m3.
Feature 04. VOC Reduction			
Requirement		Concept score	How our product contribute to obtain WELL level certification

<b>Part 1. Interior Paints and Coatings</b>	<p>The VOC limits of newly applied paints and coating meet one of the following requirements:</p> <p>a. 100% of installed products meet California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011 for VOC content.</p>	PRECONDITION	<p>a. The VOC limits for California Air Resources Board (CARB) are less than 0.11ppm.</p> <p>b. Measured Concentration of Total Volatile Organic Compounds (TVOC): Less than/equal to 0.5 mg/m3 (in compliance with CDPH/EHLB Standard Method v1.1-2010). The product is FloorScore certified</p>
<b>Part 3. Flooring</b>	<p>The VOC emissions of all newly installed flooring must meet all limits set by the following, as applicable:</p> <p>a. California Department of Public Health (CDPH) Standard Method v1.1-2010.</p>	PRECONDITION	<p>Conforms to the CDPH/EHLB Standard Method v1.1-2010 (California Section 01350), effective January 1, 2012, for the school classroom and private office parameters when modeled as Flooring.</p> <p>The product is FloorScore certified</p>

#### Feature 11. Fundamental Material Safety

Requirement	Concept score	How our product contribute to obtain WELL level certification
<b>Part 1. Asbestos and Lead Restriction</b>	PRECONDITION	<p>a. No asbestos</p> <p>b. The product contain less than 100 ppm.</p>
<b>Part 2. Lead Abatement</b>	PRECONDITION	The product contain less than 90 ppm.
<b>Part 3. Asbestos Abatement</b>	PRECONDITION	The product contain less than 90 ppm.

#### Feature 25. Toxic Material Reduction

Requirement	Concept score	How our product contribute to obtain WELL level certification
<b>Part 2. Flame Retardant Limitation</b>	OPTIMIZATION	The product don't contain halogenated flame retardants
<b>Part 3. Phthalate (Plasticizers) Limitation</b>	OPTIMIZATION	In accordance with US Consumer Product Safety Improvement Act 2008 (CPSIA) (H.R.4040) Title I, Section 108 & California Proposition 65 & Annex XV II item 51&52 of the REACH Regulation (EC) No. 1907/2006 and amendment No. 552/2009, the product contains less than 100ppm.
<b>Part 5. Urea-Formaldehyde Restriction</b>	OPTIMIZATION	The product contains urea-formaldehyde less than 100ppm.

#### Feature 74. Exterior Noise Intrusion

Requirement	Concept score	How our product contribute to obtain WELL level certification
<b>Part 1. Sound Pressure Level</b>	PRECONDITION	1. The product has IIC = 69 according to the standard ASTM E492-09

#### Feature 79. Internally Generated Noise

Requirement	Concept score	How our product contribute to obtain WELL level certification
<b>Part 1. Sound Masking Limits</b>	OPTIMIZATION	1. The product has IIC = 69 according to the standard ASTM E492-09