



PRODUCT DESCRIPTION		
Size	Overall Thickness	13.5mm
Top layer	Type	Overlay+decor melamine impregnated paper
	Thickness	0.15mm
Core	Type	High density fiber board
	Thickness	11.7mm
	Color	Black
	Density	≥850kg/m ³
Balanced layer	Type	Melamine impregnated paper
	Thickness	0.15mm
Backing	Type	EVA foam bakcing
	Thickness	1.5mm
Bevel	4 sides painted nano bevel	
Locking system	Fall down(Tight lock)	
Type of installation	Floating	
Underfloorheating compatibility	Yes but under certain condition- See installation instruction manual	
DIMENSIONAL TOLERANCE		
Thickness tolerance	+/- 0.5mm	
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	≤ 0.2mm	


	Norm	Test method	Requirement	Test results	Conclusion
CHEMICAL COMPOSITION					
Formaldehyde emission	CARB	ASTM D6007	≤ 0.11 ppm	0.046	Meet CARB phase 2 requirement
	EN 14041	EN 717-1	Release ≤ 0.124 mg/m ³	0.04	E0
VOC	Decret No2011-321	ISO 16000	TVOC<1000µg/m ³	5	VOC A
	DIBT	ISO 16000	TVOC<1000µg/m ³	24	Meet AgBB requirement - U mark certified
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 reguation
PAHs	EU REACH regulation No.	Spectrometry and chromatography	<1mg/kg	Not detected	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,	EU REACH regulation No. 1907/2006	Spectrometry and chromatography	≤ 0.1% (w/w)	Not detected	REACH compliant

PHYSICAL PROPERTIES						
Dimensional variation (humidity change)	EN 13329	EN 13329	$\Delta W/\Delta L \leq 0.9\%$	$\Delta W/\Delta L \leq 0.28\%$	Pass	
Swelling after submersion in water	EN 13329	EN 13329	18%	12%	Class 33, heavy commercial	
	NALFA LF 01-2011	NALFA LF 01-2011	16%	12%	Class 4, heavy commercial	
Impact sound reduction (IIC)	-	ASTM E492-09	-	IIC=58	IIC=58	
Sound transmission reduction (STC)	-	ASTM E90-09	-	NA	NA	
Thermal conductivity	EN 14041	EN 12667	-	0.123 W/(m.k)	Suitable for underfloor heating system	
Thermal resistance (R value)	-	EN 12667/ASTM C518	-	0.103 m ² • K/W	Suitable for underfloor heating system	
Reaction to fire	EN 14041	EN 13051-1	-	PASS	Class Cf1 -S1	
Fire resistance (CHF)	-	ASTM E648	-	1.08W/m ²	Class I	
WATER RESISTANCE/Swelling	HDF	Finished Without Click	Finished With Click and Wax	Time before Start Swelling	Real Life Swelling Ratio	
	Norms	EN 317	EN 13329	Similar to EN 13329	Real life test	Similar to EN 382-2
	Official Requirement	≤15%	≤18%	N. A.	N. A.	N. A.
Regular Laminate	Internal Standard	≤10%	≤18%	≤12%	3H	9%
	Actual Value	7-9%	14-16%	8-11%	6-8H	4-8%
Atroguard	Internal Standard	≤6%	≤12%	≤6%	24H	3%
	Actual Value	4-5%	8-11%	4-5%	25-28H	0-2%
SURFACE PROPERTIES						
Wear resistance	EN 13329	EN 13329	≥6000 cycles	6300	AC5, Class 33, Heavy Commercial	
	NALFA LF 01-2011	NALFA LF 01-2011	≥6000 cycles	6300	AC5, Class 4, Heavy Commercial	
Scratch	-	-	≥ 4N	4N	Pass	
Surface bonding	NALFA LF 01-2011	EN311/NALFA LF 01-2011	1.25 N/mm ²	1.4 N/mm ²	Class 3, commercial	
Static load (250LBS/115KG)	NALFA LF 01-2011	ASTM F970	≥ 8Mpa	15	Class 4, Heavy commercial	
Residual indentation	ASTM F1700	ASTM F1914	≤ 8% (140 lbs/63kg)	0.50%	Pass	
	EN 16511	EN 433/ISO 24343-1	≤ 0.15mm	0.03	Class 34, Heavy commercial	
Impact resistance (big ball)	EN 13329	EN 13329	≥ 1600mm	≥ 1600	IC3, Class 33, Commercial	
	NALFA LF 01-2011	NALFA LF 01-2011	≥ 1400mm	≥ 1400	Class 4, Heavy commercial	
Impact resistance (small ball)	EN 13329	EN438	≥ 15 N	16	IC3, Class 33, Heavy commercial	
	NALFA LF 01-2011	NALFA LF 01-2011	≥ 500mm (19.7 in)	950	Class 4, Heavy commercial	
Slipperiness	EN14041	EN 13893	DryCOF ≥ 0.3	0.43	Class DS	
	-	ASTM C1028	≥ 0.5	NA	NA	
	-	D 51130	≥ R9	NA	NA	
Colour fastness to light	EN 13329	ISO 105-B02:1994, Method 3a	≥ Grade 6	≥ 6	Pass	
	NALFA LF 01-2011	NALFA LF 01-2011	Slight change only	Slight change only	Class 4, Heavy commercial	
Resistance to staining	EN 13329	EN 438-2	Group 1 and 2: grade 5, group3: grade 4	Group 1 and 2: grade 5, group3: grade 4	Class 34, Heavy commercial	
	NALFA LF 01-2011	NALFA LF 01-2011	Slight change only	No change	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>Building Design and Construction</p> <p>Applies to buildings that are being newly constructed or going through a major renovation; includes New Construction, Core & Shell, Schools, Retail, Hospitality, Data Centers, Warehouses & Distribution Centers, and Healthcare</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 the environment.	1. TVOCs are less than 0.5mg/m3.
		Credit 2: Low-Emitting Materials - Option 1 Flooring	1 point		1. VOC emission are less than 0.5mg/m3.
		Credit 4: Indoor Air Quality Assessment - Option 2 Air Testing	2 points	To establish better quality indoor air in the building	1. TVOCs are less than 0.5mg/m3.
	Material & Resource	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>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. TVOCs are less than 0.5mg/m3. 3. Test report according to ISO 16000 is available on request.

LEED programm certification	Category	Credit title	LEED points attainable	Credit description	How our product contribute to obtain LEED points
 <p data-bbox="344 395 510 448">Interior Design and Construction</p> <p data-bbox="237 523 640 624">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 the environment.	1. TVOCs are less than 0.5mg/m3.
		Credit 2: Low-Emitting Materials - Option1 Flooring	1 point		1. TVOC emission are less than 0.5mg/m3.
		Credit 4: Indoor Air Quality Assessment - Option 2 Air Testing	2 points	To establish better quality indoor air in the building	1. TVOCs are less than 0.5mg/m3.
	Material & Resource	Credit 4: Material ingredient - Option 2	1 point	Minimize the use and generation of harmful substances	The product is 100% REACH compliant
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