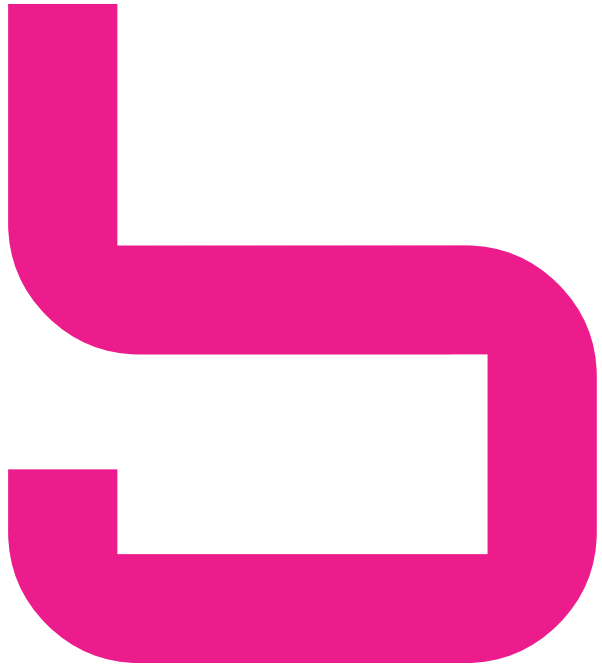
TIL Product Advantages Introduction



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Core material component

The component of TIL WPC products are 35% of plastic, 55% of oak wood fiber and 10% of additive.

Plastic: The main plastic is HDPE plastic for the core material, this type of plastic has great performance in wearing resistance and strength. Most of WPC manufacturers would choose PVC or PE to reduce the production cost. TIL's plastic supplier offers the plastic base on TIL strict raw material standard. Besides, most of the wpc supplier has lower ratio of plastic(20% - 30% plastic), the cost is lower, but the strength is low at the meantime.

Core material component

The component of TIL WPC products are 35% of plastic, 55% of oak wood fiber and 10% of additive.

Oak wood fiber: Instead of using mix wood fiber, TIL choose Oak wood fiber, which is a kind of hardwood. TIL wood fiber suppliers collect oak wood from dedicated furniture factories and mill it to powder. We have specification of the powder regarding the mesh size, moisutre, ash content, oil content, and formaldehyde content.

Co-extrusion layer material

The component of TIL WPC products are 35% of plastic, 55% of oak wood fiber and 10% of additive.

The co-extrusion layer material is a kind of engineering plastic for golf ball material, which is also called Surlyn resin. This material features in melt strength and wearing resistance.

High density

Other brand

TIL

Comparing with the wpc products from other brands, TIL wpc products is high density, which means the water absorption rate is low and the products won't be swelling easily. In addition, TIL wpc products' strength is better than others.

Fire resistance - Class B

ON REQUEST

SGS

TEST REPORT

No. : GZIN2108046149CM
Date : Aug 25, 2021
Page: 2 of 8

Summary of Results:

No.	Test Item	Test Method	Result	Conclusion
1	Fire classification for burning behavior of flooring material	EN 13501-1:2018 Clause 9 & EN ISO 9239-1:2010 & EN ISO 11925-2:2020	B_{fl}-s1	Pass

TIL fireproof products in FR formula can reach BFL-S1-D0, which is the highest fire resistant level for wpc produtcs so far.

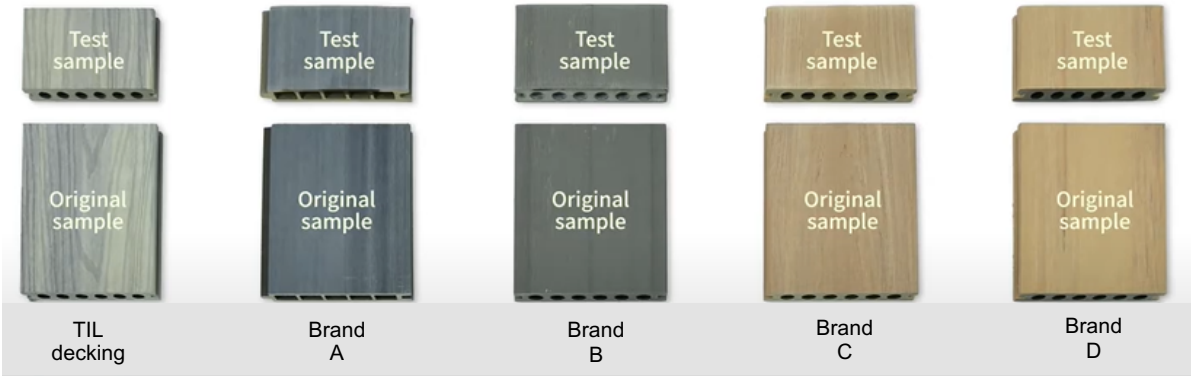
Freeze and thermal test

Test equipment

95℃ hot water container

-40℃ freezer

Test materials

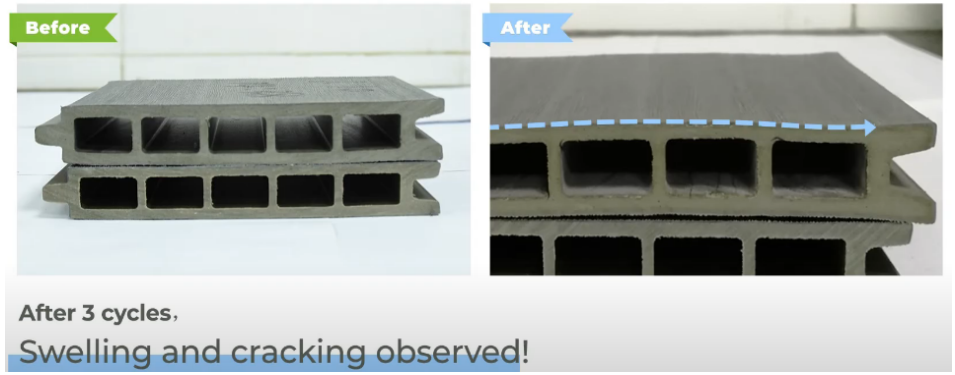


We used equipment to imitate the extreme hot, humid and cold weather conditions, and selected 4 co-extrusion composite boards of different brands on the market to complete this weather resistance test together with TIL co-extruded decking.

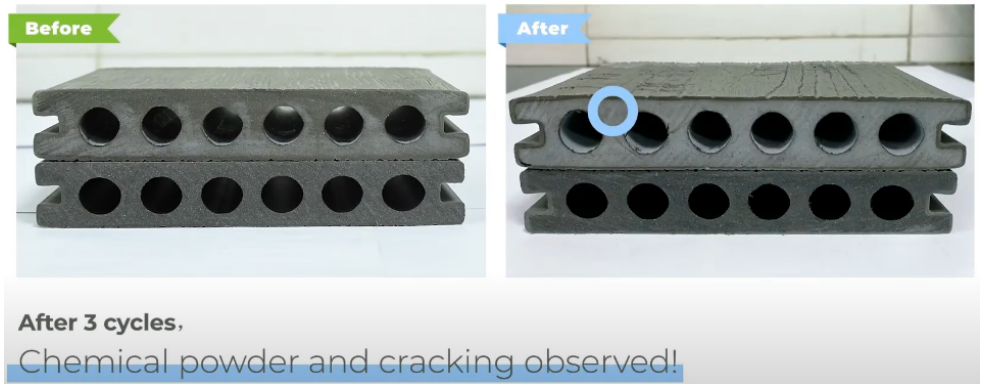
We put test samples into the hot water container and take them out after 24 hours. After that we put all the boards into the freezer for another 24 hours.

Taking the above process as a cycle, our experiment carried out three cycles.

Freeze and thermal test



Brand A



Brand B

Brand C

Brand D

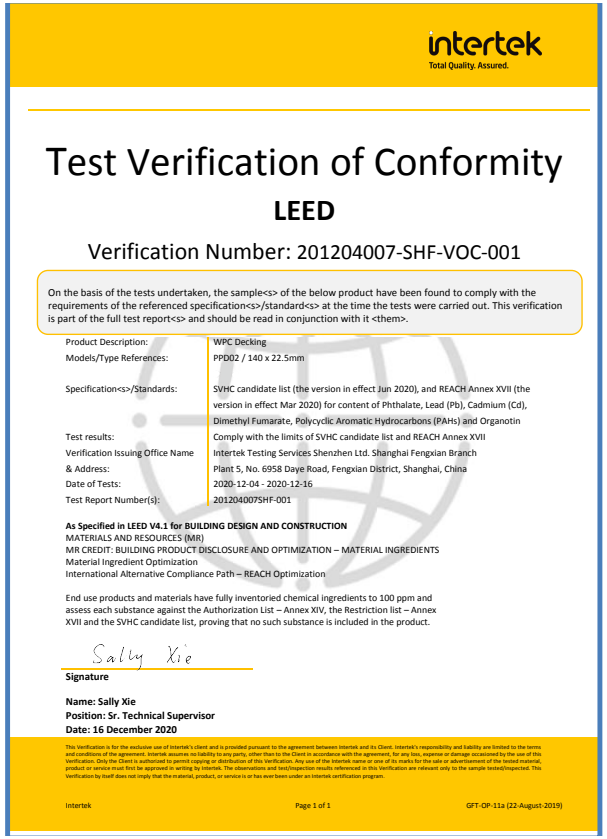
Freeze and thermal test

No swelling and cracking observed on TIL decking

TIL co-extruded decking

The weather changes in real life are not as extreme as our experiments. This further proves that Proshield composite board has excellent weather resistance.

Eco-friendly material with certification



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Total Quality. Assured.

Test Verification of Conformity

LEED

Verification Number: 201204007-SHF-VOC-001

On the basis of the tests undertaken, the sample<s> of the below product have been found to comply with the requirements of the referenced specification<s>/standard<s> at the time the tests were carried out. This verification is part of the full test report<s> and should be read in conjunction with it <them>.

Product Description:	WPC Decking
Models/Type References:	PPD02 / 140 x 22.5mm
Specification<s>/Standards:	SVHC candidate list (the version in effect Jun 2020), and REACH Annex XVII (the version in effect Mar 2020) for content of Phthalate, Lead (Pb), Cadmium (Cd), Dimethyl Fumarate, Polycyclic Aromatic Hydrocarbons (PAHs) and Organotin
Test results:	Comply with the limits of SVHC candidate list and REACH Annex XVII
Verification Issuing Office Name & Address:	Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch Plant 5, No. 6958 Daye Road, Fengxian District, Shanghai, China
Date of Tests:	2020-12-04 - 2020-12-16
Test Report Number(s):	201204007SHF-001

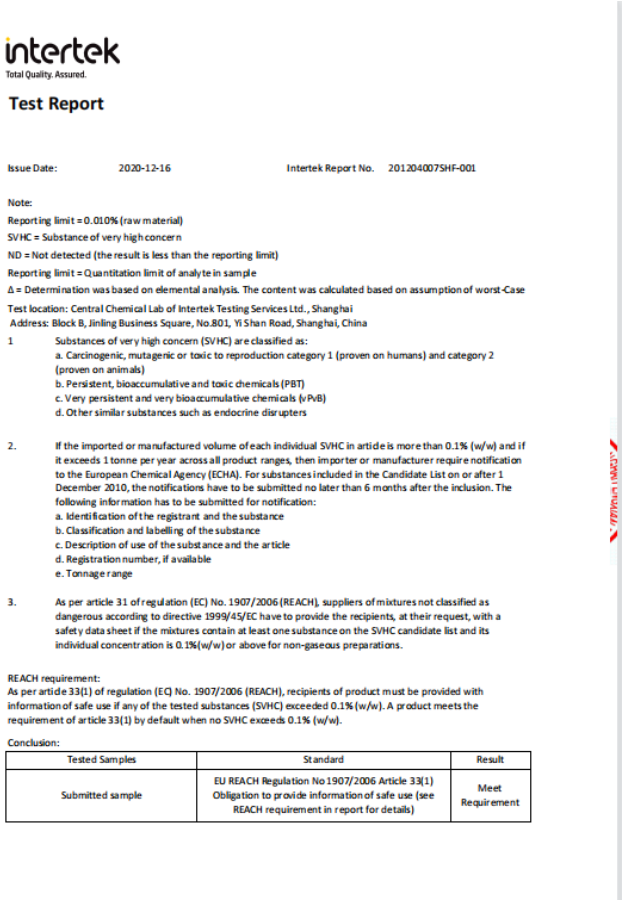
As Specified in LEED V4.1 for BUILDING DESIGN AND CONSTRUCTION
MATERIALS AND RESOURCES (MR)
MR CREDIT: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION – MATERIAL INGREDIENTS
Material Ingredient Optimization
International Alternative Compliance Path – REACH Optimization

End use products and materials have fully inventoried chemical ingredients to 100 ppm and assess each substance against the Authorization List – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list, proving that no such substance is included in the product.

Sally Xie

Signature

Name: Sally Xie
Position: Sr. Technical Supervisor
Date: 16 December 2020



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Test Report

Issue Date: 2020-12-16 Intertek Report No. 201204007SHF-001

Note:
Reporting limit = 0.010% (raw material)
SVHC = Substance of very high concern
ND = Not detected (the result is less than the reporting limit)
Reporting limit = Quantitation limit of analyte in sample
Δ = Determination was based on elemental analysis. The content was calculated based on assumption of worst-Case

Test location: Central Chemical Lab of Intertek Testing Services Ltd., Shanghai
Address: Block B, Jinling Business Square, No.801, Yi Shan Road, Shanghai, China

1 Substances of very high concern (SVHC) are classified as:
a. Carcinogenic, mutagenic or toxic to reproduction category 1 (proven on humans) and category 2 (proven on animals)
b. Persistent, bioaccumulative and toxic chemicals (PBT)
c. Very persistent and very bioaccumulative chemicals (vPvB)
d. Other similar substances such as endocrine disrupters

2. If the imported or manufactured volume of each individual SVHC in article is more than 0.1% (w/w) and if it exceeds 1 tonne per year across all product ranges, then importer or manufacturer require notification to the European Chemical Agency (ECHA). For substances included in the Candidate List on or after 1 December 2010, the notifications have to be submitted no later than 6 months after the inclusion. The following information has to be submitted for notification:
a. Identification of the registrant and the substance
b. Classification and labelling of the substance
c. Description of use of the substance and the article
d. Registration number, if available
e. Tonnage range

3. As per article 31 of regulation (EC) No. 1907/2006 (REACH), suppliers of mixtures not classified as dangerous according to directive 1999/45/EC have to provide the recipients, at their request, with a safety data sheet if the mixtures contain at least one substance on the SVHC candidate list and its individual concentration is 0.1%(w/w) or above for non-gaseous preparations.

REACH requirement:
As per article 33(1) of regulation (EC) No. 1907/2006 (REACH), recipients of product must be provided with information of safe use if any of the tested substances (SVHC) exceeded 0.1% (w/w). A product meets the requirement of article 33(1) by default when no SVHC exceeds 0.1% (w/w).

Conclusion:

Tested Samples	Standard	Result
Submitted sample	EU REACH Regulation No 1907/2006 Article 33(1) Obligation to provide information of safe use (see REACH requirement in report for details)	Meet Requirement

TIL wpc products are qualified and get the certification of LEED and REACH that were issued by authoritative testing institutions. These are the proof that TIL wpc material and eco-friendly, harmless and sustainable.

No.	Property	Test Method	Test Result						Conclusion
1	Abrasion Resistance	ASTM D7031-11(2019) Section 5.17 & ASTM D4060-19	Weight loss: 24.7mg/1000r						Pass
2	Antimicrobial Activity Test	ASTM G 21-15 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi	Test organism(s)		Concentration of spores (spores/mL)		Rating observed growth onspecimens (after 28 days)		Pass
			*Test organism		1.0x 10^6		0 Grade		
3	Boiling Test	EN 15534-1:2014 + A1:2017 Section 8.3.3	Mass change rate: 0.18%						Pass
4	Coefficient of Linear Thermal Expansion	EN 15534-1:2014+A1:2017 Section 9.2 & ISO 11359-1-2014 & ISO 11359-2-1999 Method A	43×10^{-6} K^{-1}						Pass
5	Creep Behaviour - Unknown Span in Use	With reference to EN 15534-1:2014+A1:2017 Section 7.4.2 and client' s requirement	Creep factor (C_f): 1.12 Creep recovery (E_{rc}): 46%						Pass
6	Modulus of Elasticity in Bending and Bending Strength	EN 15534-1:2014+A1:2017 Annex A	Bending strength		36MPa				Pass
			Modulus of elasticity		3730MPa				
7	Resistance to Indentation	EN 15534-1:2014+A1:2017 Section 7.5	Brinell hardness		64MPa				Pass
			Rate of elastic recovery		53%				
8	Rockwell Hardness	ASTM D785-08(2015) Procedure A	72 R						Pass
			Exposure conditions	Edge exposure			Surface exposure		
			Specimen No.	1	2	3	1	2	3
			Whether ignition occurs	Yes	Yes	Yes	Yes	Yes	Yes

9	Single Flame Source Test	EN 15534-1:2014 Section 9.6.1 & EN ISO 11925-2:2020	Exposure conditions	Edge exposure			Surface exposure			Pass
			Specimen No.	1	2	3	1	2	3	
			Whether ignition occurs	Yes	Yes	Yes	Yes	Yes	Yes	
			Whether the flame tip reaches 150 mm above the flame application point	No	No	No	No	No	No	
			The time when flame tip reaches 150 mm, s	/	/	/	/	/	/	
			Whether ignition of the filter paper occurs	No	No	No	No	No	No	
10	Striker Impacted by a Falling Weight	With reference to ASTM D4226-19ε1 Procedure A and client's requirement	Mean failure energy: 13.9J							Pass
11	Swelling and Water Absorption	EN 15534-1:2014 Section 8.3.1& EN 317:1993	Test item	Test item Thickness		Width		Length		Pass
			Mean swelling	0.17%		0.01%		0.02%		
			Max individual swelling	0.21%		0.02%		0.03%		
			Mean water absorption	0.05%						
			Max individual water absorption	0.06%						
12	Thermal Conductivity	EN 12667: 2001 (heat flow meter method)	Thermal conductivity[W/(m·K): 0.179							Pass
13	Fire classification for burning behavior of flooring material	EN 13501-1:2018 Clause 9 & EN ISO 9239-1:2010 & EN ISO 11925-2:2020	C_{fl}-S1							/