



Evaluation Report CCMC 14086-R NewTechWood UltraShield®

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “NewTechWood UltraShield®,” when used as an exterior decking in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code (NBC) of Canada 2015:

- Clause 1.2.1.1.(1)(b) of Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
 - Article 9.3.2.9., Termite and Decay Protection
 - Subsection 9.4.2., Specified Loads
 - Article 9.4.3.1., Deflections
 - Article 9.8.9.1., Loads on Stairs and Ramps
 - Article 9.23.15.5., Subfloor Thickness or Rating

This opinion is based on the CCMC evaluation of the technical evidence in Section 4 provided by the Report Holder.

2. Description

The product is a polymer-encapsulated, wood thermoplastic composite lumber (WTCL) made primarily from equal parts of reclaimed wood fibres and recycled clear plastic bottles. The polymer capping material encases the inner core of the WTCL on all four sides. The product is manufactured through a continuous extrusion process in planks with a hollow cross-section. The planks are manufactured in nominal dimensions of 22.5 mm × 138 mm and are available in lengths of 3.66 m and 4.88 m. “NewTechWood UltraShield®” is intended to be used as exterior decking installed over traditional structural wood framing.

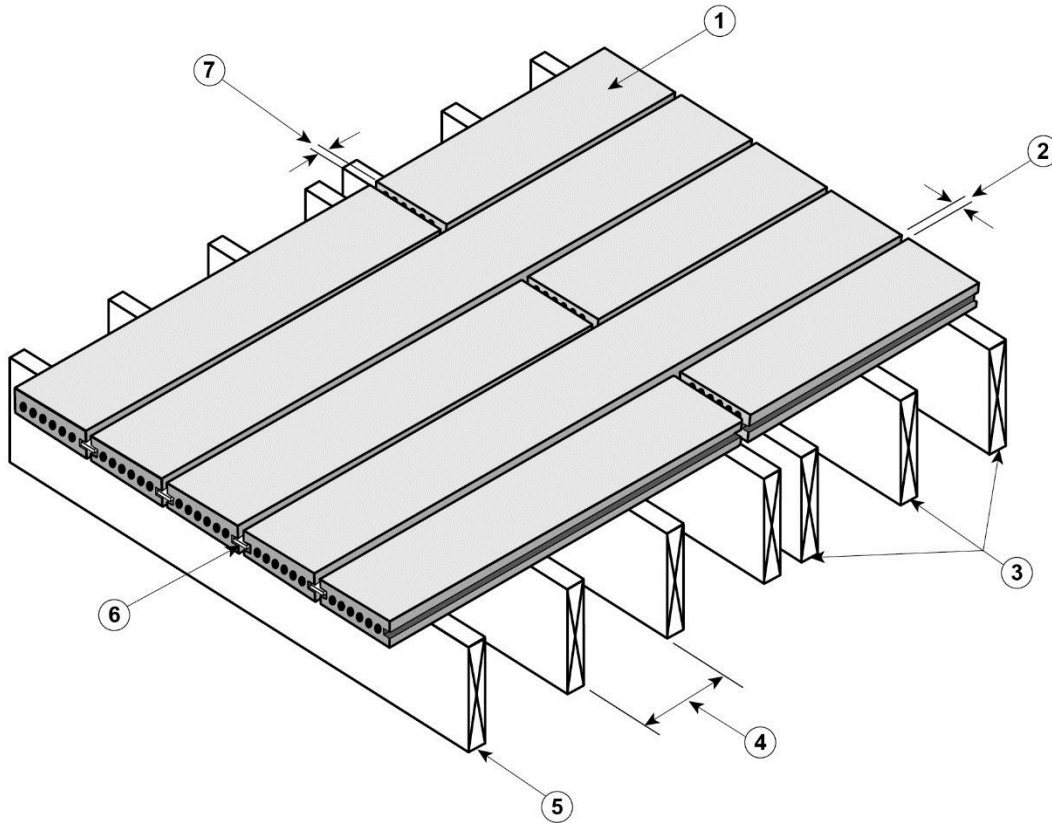


Figure 1. “NewTechWood Ultrashield®”

1. “NewTechWood Ultrashield®”
2. 6 mm or 10 mm spacing between sides of the planks, depending on the temperature at installation
3. minimum of 3 joists per plank end to end plank installation requires double joist configuration
4. maximum joist spacing of 300 mm o.c. for 22.5 mm × 138 mm planks
5. joist designed to support applicable loads
6. two 38-mm-long “T”-shaped metal fasteners per plank at each intersecting joist, 20 mm maximum cantilever at plank ends
7. 2 mm to 8 mm minimum spacing between ends of the planks, depending on the length of the plank and temperature at installation

3. Conditions and Limitations

The CCMC compliance opinion in Section 1 is contingent on “NewTechWood Ultrashield®” being used in accordance with the conditions and limitations set out below:

- The product must be installed with supports spaced no greater than 300 mm on center (o.c.). Each plank must be supported by at least three joists.
- The product must be installed with a double joist configuration at all end to end plank installations.
- The product must be installed at a minimum 150 mm height above the finished grade.
- The products must be fastened to the wood joists with fasteners made of stainless steel, or which have a corrosion protection coating,⁽¹⁾ and that conform to Article 9.23.3.1., Standards for Nails and Screws, of Division B of the NBC 2015. The planks must be fastened with at least two fasteners per joist and the fasteners must have an embedment into the structure of at least 34 mm.
- The product must be installed according to the manufacturer’s installation instructions.
- The products must be gapped end-to-end, based on the length of the plank and the temperature at installation in accordance with the manufacturer’s recommendations. The end-to-end gapping must be > 5 mm for installations below 15°C and ≤ 5 mm for installations above 15°C. The width-to-width gapping must be 3.1 mm (1/8 in.).
- The products should be installed by a knowledgeable person familiar with the product installation guide.
- The product is **not** to be considered as an equivalent to dimensional lumber.
- The product is **not** to be used as stair treads
- The product’s label or packaging must be identified with the manufacturer’s name or logo and the phrase “CCMC 14086-R.”

(1) As of January 2004, pressure-treated lumber requires specific hot-dipped galvanized fasteners for a satisfactory performance.

4. Technical Evidence

The Report Holder has submitted technical documentation for the CCMC evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

4.1 Material Requirements

Table 4.1.1 Results of Testing the Physical Properties of the Hollow Core Product

Property		Unit	Requirement	Result ^{(1),(2)}
Dimensional change	coefficient of linear expansion (thermal) longitudinal	cm/cm/°C	$< 2 \times 10^{-5}$	$3.43 \times 10^{-5(3)}$
	coefficient of linear expansion (swelling): oven dry to vacuum pressure soak	%	< 0.5 by 80% of specimens	-0.10
Strength and stiffness	modulus of elasticity (MOE)	MPa	> 750	2 545
	modulus of rupture (MOR)		> 9	23
span-to-depth ratio within 18 to 21				
Impact resistance (Izod impact, notched)		J/m	> 53.4	20.2 ⁽⁴⁾
Hardness (11.28-mm-diameter ball)		kN	> 1.8	2.0
Creep, recovery and load duration		%	< 25 for creep	39 ⁽⁵⁾
			> 75 for recovery	78
			No failure	Pass
Strength and stiffness after aging	weathering: impact resistance		> 75 of non-weathered value	97
	accelerated aging	MOE	> 50 of non-aged value	81
		MOR		94
Fastener holding capacity	metal clip fastener withdrawal strength		> 600	1 621
	lateral metal clip (direction 1)		> 720	1 259
Flame-spread rating		-	≤ 200	55
Smoke development		-	Report	Not reported

Notes to Table 4.1.1:

- (1) Average test results of six specimens, except for the “Creep, recovery and load duration” results, which are from three specimens.
- (2) Test results were obtained to classify the products and are not intended to be used as engineering design properties.
- (3) Performance result allowed based on the manufacturer’s gapping installation instructions.
- (4) Performance result allowed based on the full-scale structural impact test results.
- (5) Performance result based on testing at 400 mm o.c. support span width. As a result of failure to meet the requirement, the allowable support span was reduced to 300 mm o.c.

Table 4.1.2 Results of Testing the Durability, Decay, Termite and Slip-resistance Properties of the Product

Property		Requirement	Result		
			SPF Lumber	NewTechWood UltraShield®	
Durability	MOE	Mean percentage losses in MOE and MOR after UV exposure and accelerated aging must be less than or equal to spruce lumber.	21.4	39.9 ⁽¹⁾	
	MOR		27.9	15.3	
Decay resistance	% loss in weight	Mean percentage losses in weight and compressive strength after exposure to decay-causing fungi must be equal to or better than spruce heartwood. ⁽²⁾	Pass		
	compressive strength				
Termite resistance		Rating must be equal to or better than preservative-treated wood conforming to CSA 80.1-M97.	Pass		
Slip resistance	dry condition	longitudinal planks	> 0.5	Parallel to Planks	Perpendicular to Planks
				0.3 ⁽³⁾	0.3 ⁽³⁾
	wet condition			0.4 ³	0.5

Notes to Table 4.1.2:

- (1) Performance result based on testing at 400 mm o.c. support span width. As a result of failure to meet the requirement the allowable support span was reduced to 300 mm o.c.
- (2) Decay resistance results were obtained using southern yellow pine, sweetgum and Amine copper quaternary (ACQ) treated wood; results, although not in strict conformance with the Technical Guide, deemed acceptable based on the installation height stipulated in the Conditions and Limitations section of this Report.
- (3) These criteria may not meet all occupant expectations. Performance result allowed for the intended use, as the slip resistance is less than the reference value. The manufacturer may be contacted for further information.

4.2 Performance Requirements**Table 4.2.1 Results of Testing the Performance of the Product under Concentrated Static Loads and Impact Loads**

Property		Requirement		Result ⁽¹⁾	
		Minimum Ultimate Load (kN)	Maximum Deflection Under 0.89 kN Load (mm)	Ultimate Load (kN)	Deflection Under 0.89 kN Load (mm)
Concentrated static load	decking at 50°C	2.45	2.4	2.38	3.54
	decking at 20°C			3.40	2.47 ²
	decking at -35°C			5.27	1.77
Impact load of 102 N·m	decking at 50°C	1.78	2.0	>1.78	0.87

Notes to Table 4.2.1:

1. Test results are for 22.5 mm × 138 mm planks with supports at 400 mm o.c.
2. Performance result allowed based on installation support spacing requirement of 300 mm.

Report Holder

Huidong Meixin Plastic Lumber Products Manufacturing Co., Ltd.
Wutang 12 Tuo, Dailing Town, Huidong County,
Huizhou City, Guangdong Province
China

Telephone: +86 752 653 1999

Email: inquiry@newtechwood.com

Web Site: www.newtechwood.com

Plants

Huidong, China

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