



Evaluation Report CCMC 14121-R Inteplast Deck, Inteplast Porch, Wolf Serenity Deck and Wolf Serenity Porch Exterior Decking

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “Inteplast Deck”, “Wolf Serenity Deck”, “Inteplast Porch” and “Wolf Serenity Porch” when used as exterior decking in accordance with the conditions and limitations stated in Section 3 of this Report, comply with the National Building Code of Canada (NBC) 2015:

- Clause 1.2.1.1.(1)(a) of Division A, using the following acceptable solutions from Division B:
 - Article 9.4.2.2., Specified Snow Loads
 - Article 9.4.2.3., Platforms Subject to Snow and Occupancy Loads
 - Article 9.8.9.1., Loads on Stairs and Ramps
 - Article 9.8.9.6., Finish for Treads and Landings
- 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 9.4.2.1., Application
 - Article 9.4.3.1., Deflections
 - Article 9.8.9.3., Exterior Wood Steps
 - Article 9.23.15.5., Subfloor Thickness or Rating

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

2. Description

Inteplast Deck”, “Wolf Serenity Deck”, “Inteplast Porch” and “Wolf Serenity Porch” are exterior decking planks made of solid core foamed polyvinyl chloride (PVC) extrusions with a styrene copolymer cap layer. “Inteplast Deck” and “Wolf Serenity Deck” consist of solid profile (non-interlocking) decking boards that are 139.7 mm wide × 25.4 mm thick. “Inteplast Porch” and “Wolf Serenity Porch” consist of interlocking, tongue and groove decking boards that are 79.0 mm wide (84.1 mm wide including tongue) × 25.4 mm thick. The products are available in 28 different colours.

The products are intended to be used as exterior decking to be installed over traditional structural wood framing.

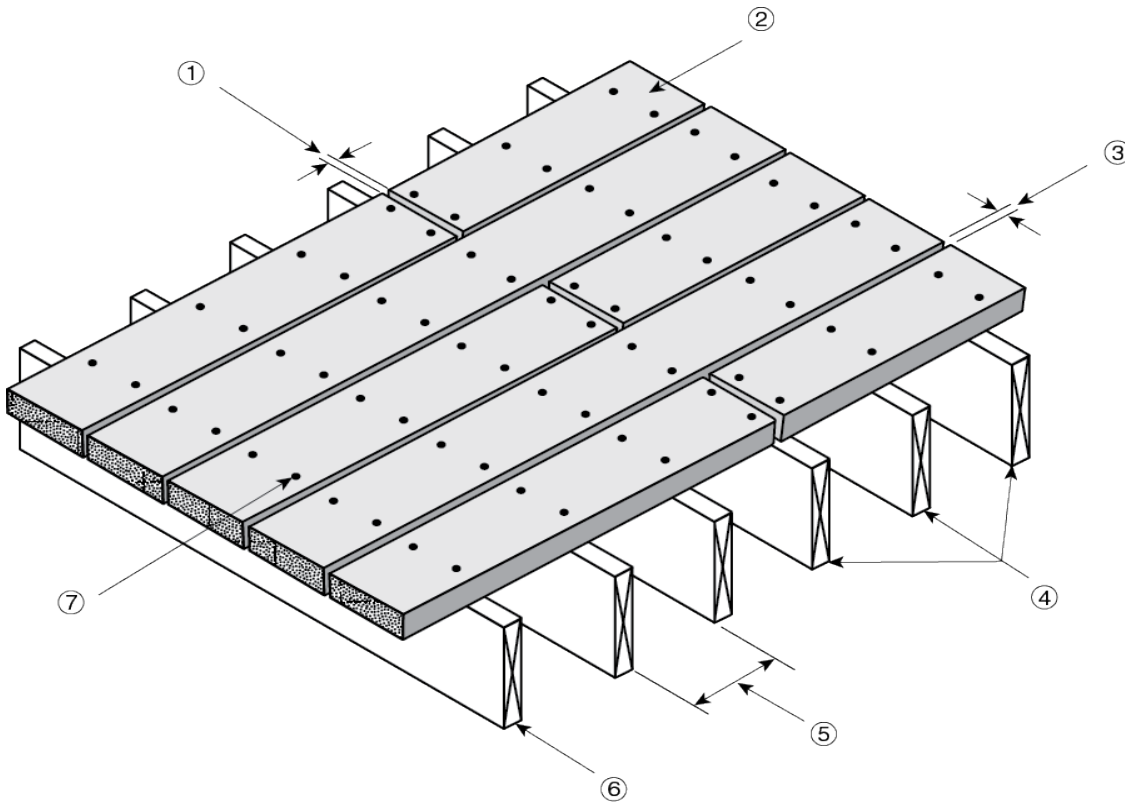


Figure 1. Installation details for “Inteplast Deck” and “Wolf Serenity Deck”, solid profile

- 1. 3 mm to 5 mm minimum spacing between ends of the planks, depending on length of plank and temperature at installation**
- 2. “Inteplast Deck” or “Wolf Serenity Deck” board**
- 3. 3 mm to 5 mm minimum spacing**
- 4. minimum of 3 joists per deck board**
- 5. maximum joist spacing at 400 mm on centre (o.c.)**
- 6. joist designed to support applicable loads**
- 7. two 63.5-mm-long fasteners (exposed fasteners) per support**

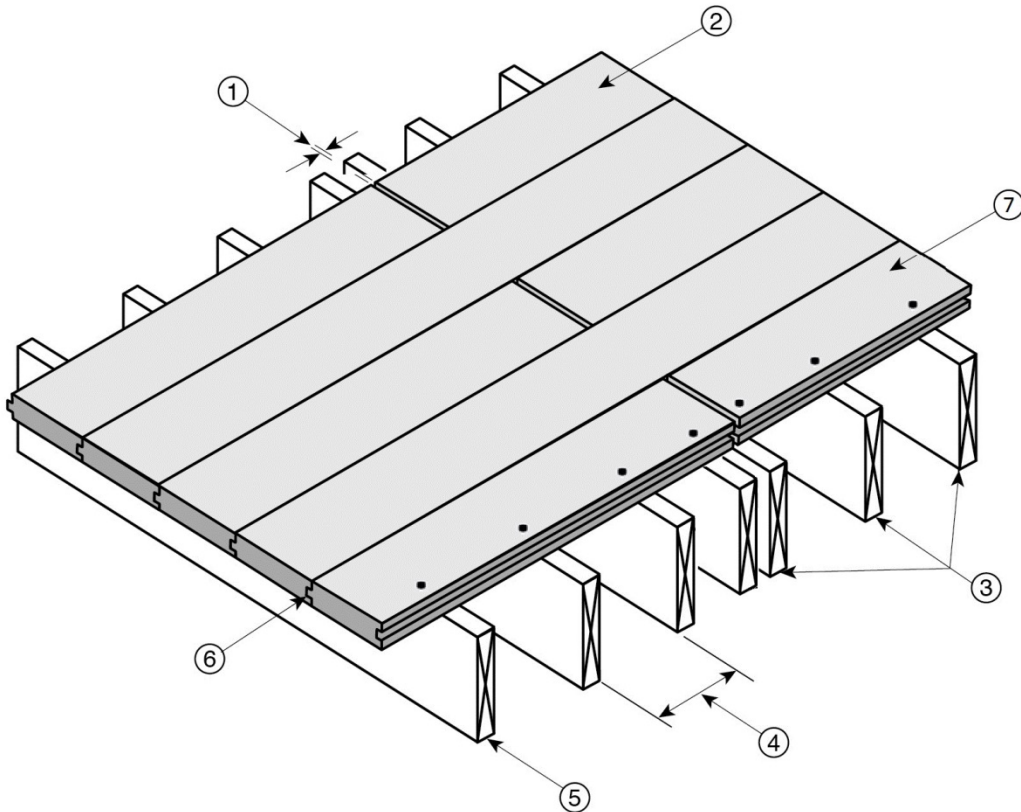


Figure 2. Installation details for “Inteplast Porch” and “Wolf Serenity Porch”, interlocking (tongue-and-groove) profile

1. 3 mm minimum spacing
2. “Inteplast Porch” or “Wolf Serenity Porch” non-starting board, one 63.5-mm-long fastener per support at the tongue with 30° to 45° angles off vertical
3. minimum of 3 joists per deck board
4. maximum joist spacing at 400 mm o.c.
5. joist designed to support applicable loads
6. no spacing, tongue and groove interlocking boards, and product must not be installed below 0°C temperatures
7. starting board, two 63.5-mm-long fasteners per support. First fastener (exposed) perpendicular and the second at the tongue with 30° to 45° off vertical.

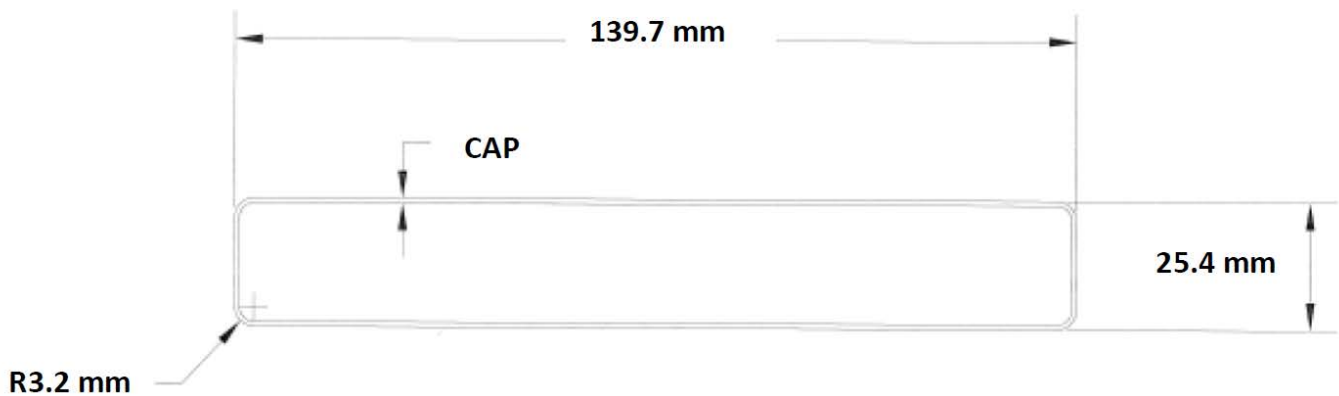


Figure 3. “Inteplast Deck” and “Wolf Serenity Deck” solid profile

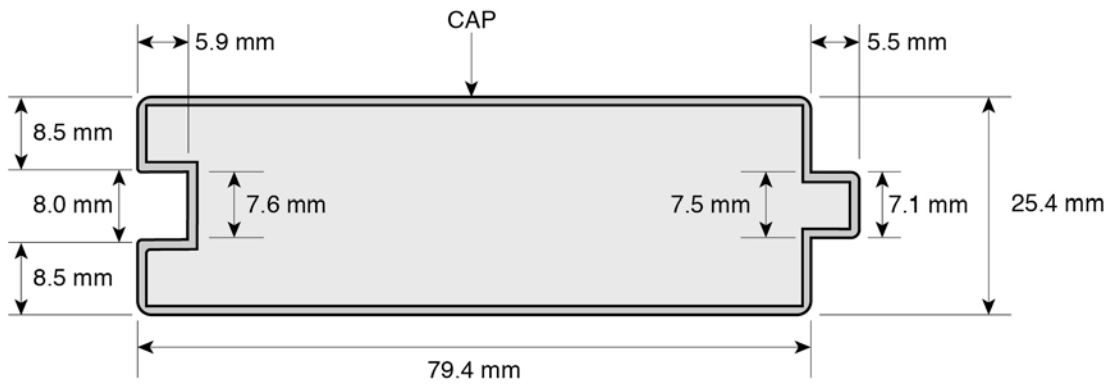


Figure 4. “Inteplast Porch” and “Wolf Serenity Porch” interlocking profile

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the products being used in accordance with the conditions and limitations set out below.

- The products must be installed with supports spaced no greater than 400 mm o.c. Each plank must be supported by at least three joists.
- The products must be fastened to the wood joists with fasteners specified by the manufacturer and that conform to Article 9.23.3.1., Standards for Nails and Screws, of Division B of the NBC 2015. The fasteners must have a corrosion-protection coating or be made of stainless steel.
 - “Inteplast Deck” and “Wolf Serenity Deck” planks must be fastened with at least two 63.5-mm-long fasteners per support;
 - “Inteplast Porch” and “Wolf Serenity Porch” interlocking (tongue-and-groove) **starting** planks must be fastened with at least two 63.5-mm-long fasteners: one vertical and the other with 30° to 45° angles off vertical at the tongue section; and
 - “Inteplast Porch” and “Wolf Serenity Porch” interlocking (tongue-and-groove) **non-starting** planks must be fastened with at least one 63.5-mm-long fastener at the tongue section with 30° to 45° angles off vertical.

Note: As of January 2004, pressure-treated lumber requires specific hot-dipped galvanized fasteners for satisfactory performance.

- “Inteplast Deck” and “Wolf Serenity Deck” (solid profile) gapping requirements:
 - The minimum width-to-width gapping must be 3 mm (0.12 in.) to 5 mm (0.18 in.); and
 - The minimum end-to-end gapping must be 3 mm (0.12 in.) for installations at 0°C to 24°C, and 5 mm (0.18 in.) for installations below 0°C.
- “Inteplast Porch” and “Wolf Serenity Porch” (interlocking – tongue-and-groove) gapping requirements:
 - There is no width-to-width gapping for “Inteplast Porch” and “Wolf Serenity Porch” since they are interlocking (tongue-and-groove) decking systems.
 - The minimum end-to-end gapping must be 3 mm (0.12 in.).
 - **“Inteplast Porch” and “Wolf Serenity Porch” (interlocking – tongue-and-groove) must not be installed at temperatures below 0°C.**
- “Inteplast Deck” and “Wolf Serenity Deck” (solid profile) can be used as stair treads at 230 mm (9 in.) o.c. spacing.
- “Inteplast Porch” and “Wolf Serenity Porch” (interlocking – tongue-and-groove) **cannot** be used as stair treads.
- The products have **not** been evaluated for applications where termite and decay protection is required as per Article 9.3.2.9., Termite and Decay Protection, of Division B of the NBC 2015.
- The products are **not** to be considered as an equivalent to dimensional lumber.
- The products should be installed by a knowledgeable person familiar with the product installation guide.
- The products’ label or packaging must be identified with the manufacturer’s name or logo and the phrase “CCMC 14121-R.”

4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's 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 Test Results for Basic Physical and Mechanical Properties

Property		Unit	Requirement	Result ⁽¹⁾	
Dimensional change	coefficient of linear thermal expansion – longitudinal		°C ⁻¹	$< 2 \times 10^{-5}$	3.39×10^{-5} ⁽²⁾
	coefficient of linear thermal expansion – transverse		°C ⁻¹	$< 2 \times 10^{-5}$	3.98×10^{-5} ⁽²⁾
	coefficient of linear expansion (swelling)	oven-dry to vacuum pressure soak	%	≤ 0.5, by 80% of specimens	- 0.40
Strength and stiffness – “Inteplast Deck” and “Wolf Serenity Deck”		flexural rigidity (EI)	kN·mm ²	≥ 300 000	269 000 ⁽³⁾
		moment capacity (Mr)	N·mm	≥ 190 000	329 300
Strength and stiffness – “Inteplast Porch” and “Wolf Serenity Porch”		flexural rigidity (EI)	kN·mm ²	≥ 300 000	212 900 ⁽³⁾
		moment capacity (Mr)	N·mm	≥ 190 000	236 600
Creep, recovery and load duration – “Inteplast Deck” and “Wolf Serenity Deck”		%	≤ 25 for creep	12	
			≥ 75 for recovery	94	
			No failure	Pass	
Creep, recovery and load duration – “Inteplast Porch” and “Wolf Serenity Porch”		%	≤ 25 for creep	15	
			≥ 75 for recovery	93	
			No failure	Pass	
Strength and stiffness after aging	weathering	impact resistance	%	≥ 50% failure (10 J)	39.4% ⁽⁴⁾
	accelerated aging – “Inteplast Deck” and “Wolf Serenity Deck”	EI	%	≥ 50 of non-aged value	92
		Mr			96
	accelerated aging – “Inteplast Porch” and “Wolf Serenity Porch”	EI	%	≥ 50 of non-aged value	90
Mr		92			
Fastener-holding capacity		nail withdrawal strength	N	≥ 600	2 353
		lateral nail strength	N	≥ 720	2 993
Flame-spread rating		—	≤ 200	90	

Notes to Table 4.1.1:

- (1) Test results were obtained to classify the product and are not intended to be used for engineering design properties.
- (2) Performance result allowed based on the manufacturer's gapping installation instructions. “Inteplast Porch” and “Wolf Serenity Porch” (interlocking – tongue-and-groove) must not be installed at temperatures below 0°C.
- (3) Deemed acceptable based on modulus of elasticity criteria (MoE ≥ 750 MPa) by calculation.
- (4) Performance result allowed based on the full-scale structural impact test results.

4.2 Performance Requirements

Table 4.2.1 Test Results for Performance Under Both Concentrated Static Loads and Impact Loads – “Inteplast Deck” and “Wolf Serenity Deck”

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) ⁽²⁾
Concentrated load	decking at 50°C	2.45	2.0	3.99	5.46
	decking at 20°C			4.49	4.49
	decking at -35°C			5.37	3.69
		Minimum Ultimate Load Following Impact Load (kN)	Maximum Deflection Under 0.89-kN Load Following Impact Load (mm)	Ultimate Load Following Impact Load (kN)	Deflection under 0.89-kN Load Following Impact Load (mm)
Impact load of 102 N·m	decking at 50°C	1.78	2.0	1.78	4.09 ⁽³⁾

Notes to Table 4.2.1:

- (1) Test results for planks with supports at 400 mm o.c.
- (2) The deflection results exceed the requirements. The additional deflection will not impact the overall performance.
- (3) Deemed acceptable. Although this result (4.09 mm) exceeds the 2.0 mm requirement, the additional deflection is not considered significant for material at 50°C. No failure after impact load and recovery was greater than 94%.

Table 4.2.2 Test Results for Performance Under Both Concentrated Static Loads and Impact Loads – “Inteplast Porch” and “Wolf Serenity Porch”

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) ⁽²⁾
Concentrated load	decking at 50°C	2.45	2.0	7.70	2.88
	decking at 20°C			7.97	2.21
	decking at -35°C			9.71	2.44
		Minimum Ultimate Load Following Impact Load (kN)	Maximum Deflection Under 0.89-kN Load Following Impact Load (mm)	Ultimate Load Following Impact Load (kN)	Deflection Under 0.89-kN Load Following Impact Load (mm)
Impact load of 102 N·m	decking at 50°C	1.78	2.0	1.78	2.52 ⁽³⁾

Notes to Table 4.2.2:

- (1) Test results for planks with supports at 400 mm o.c.
- (2) The deflection results exceed the requirements. The additional deflection will not impact the overall performance.
- (3) Deemed acceptable. Although this result (2.52 mm) exceeds the 2.0 mm requirement, the additional deflection is not considered significant for material at 50°C. No failure after impact load and recovery was greater than 93%.

Table 4.2.3 Test Results for Durability

Property	Requirement	Result	
		Spruce-Pine-Fir (S-P-F) Lumber	“Inteplast Deck” and “Wolf Serenity Deck” Board
Bending stiffness	Mean percentage loss in bending stiffness (EI) after UV exposure ⁽¹⁾ and accelerated aging ⁽²⁾ must be less than or equal to spruce lumber.	49.7%	5.8%
Moment capacity	Mean percentage loss in moment capacity (M _p) after UV exposure ⁽¹⁾ and accelerated aging ⁽²⁾ must be less than or equal to spruce lumber.	63.3%	15.0%

Notes to Table 4.2.3:

- (1) 4 000 h of Cycle 1 as outlined in Appendix X3.1 of ASTM G 155-13, “Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.”
- (2) The accelerated aging cycle, which includes wetting, freezing, thawing and drying, is repeated five times.

Table 4.2.4 Test Results for Performance Under Concentrated Static Load – Stair Tread – “Inteplast Deck” and “Wolf Serenity Deck”

Property		Requirement		Result ⁽¹⁾	
		Minimum Ultimate Load (kN)	Maximum Deflection Under 1 kN (mm)	Applied Ultimate Load (kN)	Deflection Under 1 kN (mm)
Concentrated load	stair tread	5.0 ⁽²⁾	0.75	6.61	2.24 ⁽⁴⁾
	stair tread nosing	5.0 ⁽³⁾		5.35	

Notes to Table 4.2.4:

- (1) Test results are for stair stringers spaced at 300 mm o.c. at a test condition of 50°C. Three specimens were tested for each test.
- (2) Applied through a 75-mm-diam disk positioned at the centre line of the plank and midway between stringers.
- (3) Applied through a 38-mm-diam disk positioned along the outside edge of the nosing at the stringer location.
- (4) Maximum joist spacing for stair treads has been reduced to 230 mm.

Table 4.2.5 Test Results for Wind Uplift Resistance for Interlocking (Tongue-and-Groove) Decking – “Inteplast Porch” and “Wolf Serenity Porch”

Property	Requirement – Minimum Ultimate Load (kN)	Result ⁽¹⁾ - Applied Ultimate Load (kN)
Concentrated load	No sign of fastener withdrawal, fastener head pull-through or interlock joint failure at 0.20 kN	7.35

Note to Table 4.2.5:

- (1) Applied through a 75-mm steel disk near a plank interlocking edge at mid-span of the middle span (three span configuration).

4.3 Additional Performance Data

Table 4.3 Test Results for Additional Performance Data

Property	Unit	Requirement	Result
Density	kg/m ³	Report value	640
Hardness (11.28-mm-diam ball)	kN	≥ 1.8	3.23
Gardner Impact Resistance	—	≤ 50% failure (10 J)	100% failure after impact of 10 J ⁽¹⁾
Slip resistance (longitudinal)	dry condition	≥ 0.5	0.74
	wet condition		0.75
Slip resistance (transverse)	dry condition	≥ 0.5	0.85
	wet condition		0.87

Note to Table 4.3:

- (1) Performance result allowed based on the full-scale structural impact test results. However, this criterion may not meet all occupant expectations. The manufacturer must be contacted for further information.

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