



Evaluation Report CCMC 13690-R AZEK Deck

MASTERFORMAT:	06 73 15.02
Evaluation issued:	2014-04-14
Re-evaluated:	2014-05-22
Re-evaluation due:	2017-04-14

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “AZEK Deck”, when used as exterior decking in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(a), 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), 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
 - 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

“AZEK Deck” Harvest mono-extruded deck boards are made from foamed polyvinyl chloride (PVC) and cellulosic fibre with ultraviolet (UV)-resistant additives and colorants. “AZEK Deck” Arbor, Terra and Harvest co-extruded deck boards are made from PVC and proprietary mineral additives with UV-resistant additives and colorants. The composite products are manufactured through a continuous extrusion/co-extrusion process into planks of solid cross-sections of varying thicknesses. Typical board dimensions are 140 mm wide by 25 mm thick.

The product is intended to be used as exterior decking to be installed over traditional structural wood framing.

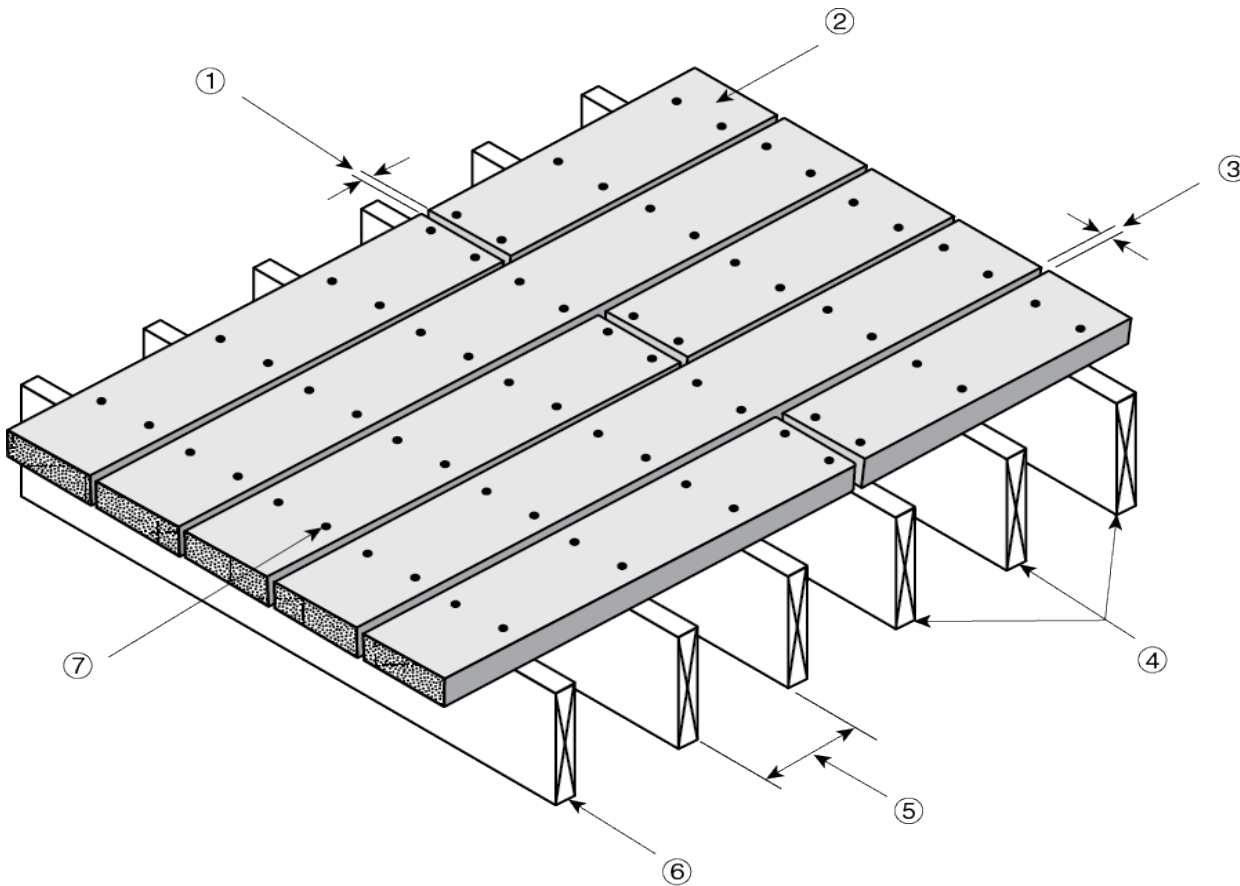


Figure 1. Installation details for the product

1. no gapping necessary
2. “AZEK Deck” board
3. 3 mm to 6 mm gapping
4. minimum of 3 joists per deck board
5. maximum joist spacing at 400 mm o.c.
6. joist designed to support applicable loads
7. two 57-mm-long fasteners per support

3. Conditions and Limitations

CCMC’s compliance opinion in Section 1 is bound by the “AZEK Deck” being used in accordance with the conditions and limitations set out below.

- The product must be installed with supports spaced no greater than 400 mm on centre (o.c.). Each plank must be supported by at least three joists.
- The product must be fastened to the wood joists with fasteners specified by the manufacturer and conforming to Article 9.23.3.1., Standards for Nails and Screws, of Division B of the NBC 2010. The fasteners must have a corrosion protection coating or be made of stainless steel. The planks must be fastened with at least two 57-mm-long fasteners per support.
Note: As of January 2004, pressure-treated lumber requires specific hot-dipped galvanized fasteners for satisfactory performance.
- The width-to-width gapping can vary from 3 mm (0.12 in.) to 6 mm (0.24 in.).
- The product can be used where termite protection is required as per Article 9.3.2.9. of Division B of the NBC 2010.
- The product can be used as stair treads at 230 mm (9 in.) o.c. spacing.
- The product is **not** to be considered as an equivalent to dimensional lumber.

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 expansion (thermal)		°C ⁻¹	$< 2 \times 10^{-5}$	1.69×10^{-6}
	coefficient of linear expansion (swelling)	oven-dry to vacuum pressure soak	%	≤ 0.5, by 80% of specimens	0.13
Strength and stiffness		flexural rigidity (EI)	kN·mm ²	≥ 300 000	Pass
		moment capacity (Mr)	N·mm	≥ 190 000	Pass
Creep, recovery and load duration			%	≤ 25 for creep	18
				≥ 75 for recovery	84
				No failure	Pass
Strength and stiffness after aging	weathering	impact resistance	%	≥ 75 of non-weathered value	78%
	accelerated aging	EI	%	≥ 50 of non-aged value	Pass
		Mr			Pass
Fastener holding capacity		nail withdrawal strength	N	≥ 600	2 626
		lateral nail strength	N	≥ 720	1 416
Flame-spread rating			—	≤ 200	25

Note 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.

4.2 Performance Requirements

Table 4.2.1 Test Results for Performance Under Both 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) ²
Concentrated load	decking at 50°C	2.45	2.0	2.59	10.29
	decking at 20°C			6.90	3.71
	decking at -35°C			4.30	4.05
		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	7.63 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 (7.63 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 96%.

Table 4.2.2 Test Results for Durability

Property	Requirement	Result	
		S.P.F. Lumber	“AZEK Deck” Board
Bending stiffness	Mean percentage loss in bending modulus of elasticity (MOE) after UV exposure ¹ and accelerated aging ² must be less than or equal to spruce lumber.	23.0%	Pass
Bending strength	Mean percentage loss in bending stress modulus of rupture (MOR) after UV exposure ¹ and accelerated aging ² must be less than or equal to spruce lumber.	28.3%	Pass

Notes to Table 4.2.2:

- ¹ 4 500 hours of Xenon-Arc exposure following Cycle 1 of ASTM D 2565-99, “Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications.”
- ² Five cycles of accelerated aging (wetting, freezing, thawing and drying)

Table 4.2.3 Test Results for Termite Resistance

Property	Requirement	Result
Termite resistance	Rating must be equal to or better than preservative-treated wood conforming to CAN/CSA-O80.1.	Pass

Table 4.2.4 Test Results for Performance Under Concentrated Static Load – Stair Tread

Property		Requirement		Result ¹
		Minimum Ultimate Load (kN)	Maximum Deflection under 1 kN (mm)	Deflection under 1 kN (mm)
Concentrated load	stair tread	1 ²	0.75	1.33 ⁴
	stair tread nosing	1 ³		1.64

Notes to Table 4.2.4:

- ¹ Test results are for stair stringers spaced at 230 mm o.c. at a test condition of 50°C and 80% RH. Three specimens were tested for each test.
- ² Applied through a 75-mm-diameter disk positioned at the centre line of the plank and midway between stringers.
- ³ Applied through a 38-mm-diameter disk positioned along the outside edge of the nosing at the stringer location.
- ⁴ Deemed acceptable as the deflection is still very low at 50°C.

4.3 Additional Performance Data

Data in this section does not form part of CCMC's opinion in Section 1.

Table 4.3.1 Test Results for Additional Performance Data¹

Property		Unit	Reference Value	Result
Dimensional tolerances	width	mm	—	140
	thickness	mm	—	25
Density		kg/m ³	—	661
Hardness (11.28-mm-diameter ball)		kN	≥ 1.8	659
Slip resistance (longitudinal)	dry condition	—	≥ 0.5	0.28 ²
	wet condition			0.59

Notes to Table 4.3.1:

- ¹ Results provided in Table 4.3.1 do not invalidate CCMC's opinion concerning the product's compliance with the NBC 2010.

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- 2 Having fallen to 0.28 under the dry condition, no surface finishes met the 0.5 criterion. This criterion may not meet all occupant expectations. The manufacturer may be contacted for further information.
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Date modified:
2014-06-09