



BUILDING CODE EVALUATION REPORT

Reference Number: 122154

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DIVISION: 06 00 00 – WOOD, PLASTICS AND COMPOSITES

REPORT HOLDER:

Eovations, LLC
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REPORT SUBJECT : DeckKorators Polypropylene Mineral Composite Exterior Decking (*Pioneer, Vault, Voyage, Summit & Excursion boards*)

1.0 SCOPE OF EVALUATION

1.1 This Building Code Evaluation report addresses compliance of the DeckKorators polypropylene mineral composite exterior deck boards (installed on joists spaced @ 406 mm) with the following Code:

- Ontario Building Code (OBC - current in-force version)

1.2 The following documents were reviewed and utilized in preparation of this report:

- B9167.01-119-19-R1 (Architectural Testing Report)
- CCMC 14092-R March 2023 (Canadian Code Compliance Evaluation)
- CCRR-0195 December 2023 (Code Compliance Research Report)
- F9384.01-119-19-R2 (Intertek – Architectural Testing Report for Vault & Frontier)
- H9030.01-119-16-R0 (Intertek Test Report for Pioneer)
- R3081.01-119-19-R0 (Intertek Test report for composite recipe variations)

2.0 APPLICABLE CODE REQUIREMENTS

2.1 Relevant code sections from the Ontario Building Code (OBC, current in-force edition):

4.1.5.5. Loads on Exterior Areas

(3) Exterior areas accessible to pedestrian traffic, but not vehicular traffic, shall be designed for their intended use, but not for less than the greater of,

- (a) the live load prescribed for assembly areas in Table 4.1.5.3., or
- (b) the snow and rain loads prescribed in Subsection 4.1.6.



Table 4.1.5.3.
Specified Uniformly Distributed Live Loads on an Area of Floor or Roof
 Forming Part of Sentence 4.1.5.3.(1)

Use of Area of Floor or Roof	Minimum Specified Load, kPa
Assembly Areas	4.8
(a) Except for the areas listed under (b), (c), (d) and (e), assembly areas with or without fixed seats including	
Arenas ⁽¹⁾ (areas without fixed seats that have backs)	
Auditoria	
Churches (areas without fixed seats that have backs)	
Dance floors	
Dining areas ⁽²⁾	
Foyers and entrance halls	
Grandstands ⁽¹⁾ (areas without fixed seats that have backs), reviewing stands and bleachers	
Gymnasias	
Lecture halls ⁽¹⁾ (areas without fixed seats that have backs)	
Museums	
Promenades	
Rinks	
Stadia ⁽¹⁾ (areas without fixed seats that have backs)	
Stages	
Theatres (areas without fixed seats that have backs)	
Other areas with similar uses	
(b) Classrooms and courtrooms with or without fixed seats ⁽¹⁾	2.4
(c) Portions of assembly areas with fixed seats that have backs for the following uses:	2.9
Arenas ⁽¹⁾	
Grandstands ⁽¹⁾	
Stadia ⁽¹⁾	2.4
(d) Portions of assembly areas with fixed seats that have backs for the following uses:	
Churches	
Lecture halls ⁽¹⁾	
Theatres	
(e) Vomitoria, exits, lobbies and corridors ⁽¹⁾	4.8

9.4.2.3. Platforms Subject to Snow and Occupancy Loads

(1) Balconies, decks and other accessible exterior platforms intended for an occupancy and subject to snow loads shall be designed to carry the specified roof snow load or 1.9 kPa, whichever is greater, where the platform, or each segregated area of the platform, serves a single dwelling unit.

9.4.3.1. Deflections

- (1) The maximum deflection of structural members shall conform to Table 9.4.3.1.
 (2) Dead loads need not be considered in computing deflections referred to in Sentence (1).

Table 9.4.3.1.
Maximum Deflections
 Forming Part of Sentence 9.4.3.1.(1)

Structural Members	Type of Ceiling Supported	Max. Allowable Deflection as an Expressed Ratio of the Clear Span
Roof rafters, roof joists and roof beams	No ceiling	1/180
	Other than plaster or gypsum board	1/240
	Plaster or gypsum board	1/360
Ceiling joists	Other than plaster or gypsum board	1/240
	Plaster or gypsum board	1/360
Floor beams, floor joists and floor decking	All cases	1/360
Beams, joists and decking for balconies, decks and other accessible exterior platforms	Serving a single dwelling unit	1/240
	Other	1/360



3.0 CODE EVALUATION

3.1 Analysis Summary

The following products have been evaluated by The Canadian Construction Materials Centre (CCMC) intended to be used as exterior decking installed over traditional structural wood framing supports spaced at no greater than 300 mm o.c:

- DeckKorators® Pioneer
- DeckKorators® Vault
- DeckKorators® Voyage

The DeckKorators® Summit and Excursion deck boards have not been evaluated separately. However, Eovations notes that the Summit and Excursion deck boards have the same chemical composition and physical properties as the DeckKorators® Voyage deck board. The difference is only in the deck embossment which leads to a different appearance.

Based on the review of the test data and calculations for stiffness and strength, the products noted herein satisfactorily meet the OBC code requirements for uniformly distributed loading and deflection for spans up to 406 mm (16”).

3.2 Analysis Discussion

Calculations performed for the polypropylene mineral composite exterior deck boards indicate that the four compared decking systems meet the requirements of the Ontario Building Code.

The Moment of Inertia values (I) for the four above noted deck boards was calculated. It is a quantitative measure of the stiffness of the cross-sections. The support conditions were checked for 406 mm spacing as it is a standard practice in Ontario to space the traditional structural framing under external decks at 16” (406mm) o.c. instead of limiting it to 300 mm o.c.

A uniformly distributed live load of 4.8 kPa (non-residential) applied over the grooved decks spanning 406 mm o.c will produce the deflection values as summarized in Table 1.



Table 1: Deflection calculations utilizing Modulus of Elasticity Values

		Pioneer	Vault	Voyage	Summit/Excursion
Width	mm	132.1	139.7	139.7	139.7
Depth	mm	20.3	21.2	21.2	21.2
Area	mm ²	2,599	2,879	2,879	2,879
Moment of Inertia, I	mm ⁴	90,870	109,755	109,755	109,755
Simply Supported Spans					
Uniformly Distributed Load, q	kPa	4.8	4.8	4.8	4.8
Moment	kN-m	0.014	0.014	0.014	0.014
Deflection, Δmax	mm				
• Control Set		1.1	0.95	0.95	0.95
• 50°C temperature		1.6	1.3	1.3	1.3
Continuous Spans					
Uniformly Distributed Load, q	kPa	4.8	4.8	4.8	4.8
Moment	kN-m	0.011	0.012	0.012	0.012
Deflection, Δmax	mm				
• Control Set		0.57	0.49	0.49	0.49
• 50°C temperature		0.92	0.69	0.69	0.69

Per the code excerpts noted in Section 2.0, allowable deflections for residential applications are L/240 (1.7mm) and for non-residential applications are L/360 (1.1mm) for which the DeckKorators polypropylene composite mineral decking handily meet the requirements for uniformly distributed live loads. When accounting for thermal effects due to placement in a location where the deck boards could reach 50°C temperature, the non-residential application shows deflections higher than the required L/360 and thus would not be recommended for such applications.

Thus, we can conclude the above noted DeckKorators deck boards (*Pioneer, Vault, Voyage, Summit and Excursion*) when installed on joists spaced at 406 mm (16") meet the requirements of the OBC for residential applications.

One limitation to note is that under sustained concentrated load (such as a heavy BBQ, fire pit, etc.), reduced spans are recommended in these areas. The following text has been added to the installation instructions to account for these scenarios:

“Homeowner/Contractor to install solid bridging at locations where sustained heavy point loads from BBQ’s, fire pits, pergola’s etc., are anticipated. Such bridging shall be installed perpendicular to the deck joists at 304mm on-center in the area(s) where the point load(s) will be applied. Alternatively, the joist spacing in these areas can be reduced from 406mm to 304mm on-centre. Consult a professional engineer for input for significant heavy structures.”

4.0 CONCLUSIONS

The DeckKorators deck boards: *Pioneer, Vault, Voyage, Summit and Excursion* meet the requirements of the OBC for residential only applications when installed per the manufacturer’s requirements at spans up to 406 mm (16"). For light commercial



applications, the OBC code requirements would be installing the deck board on more than 2 spans. If this cannot be accommodated, a smaller joist spacing of 305 mm (12") shall be used to account for the thermal effects on the deck boards.

5.0 LIMITATIONS OF ACCEPTANCE

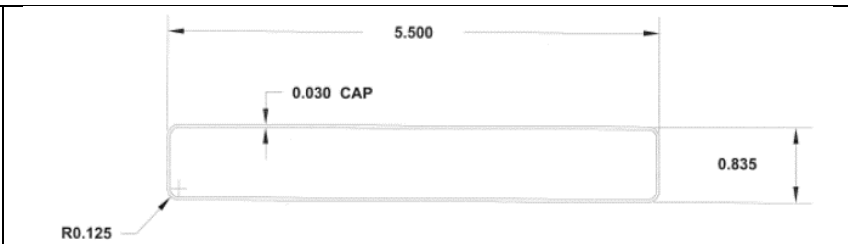
The DeckKorators polypropylene mineral composite deck board described in this Report comply with those codes listed in Applicable Codes section above and are subject to the following conditions:

1. The deck boards are limited to installation for residential (individual dwelling units) decks or light commercial applications (with a reduced joist spacing as noted above).
2. Installation of the deck board must comply with this Report, the manufacturer's published installation instructions & the Stowaway or GRK fastener and the applicable code. When the deck board manufacturer's installation instructions differ from this Report, this Report governs.
3. The fasteners outlined in the manufacturer's installation instructions must be used for the installation of the DeckKorators polypropylene mineral composite deck boards only. The compatibility of the fasteners to treated supporting construction has not been evaluated.
4. The DeckKorators polypropylene mineral composite deck boards indicated in this Report must be fastened to the supporting construction as indicated in the manufacturer's installation manual and outlined in this Report.
5. When required, the structural deck board layout must be designed by a design professional and submitted to the authority having jurisdiction for final acceptance.
6. DeckKorators polypropylene mineral composite deck boards have not been evaluated as a member of a fire-resistance-rated assembly.
7. UFP Ventures II has a Third-Party inspection program provided by Intertek.
8. Any of the above noted deck boards used as a stair tread are to be supported by stringers spaced at 8" o.c. (maximum).
9. The structural design for code compliance of supporting members for the deck boards has not been evaluated and is not part of this Report.
10. Any material changes to the properties of the DeckKorators polypropylene mineral composite deck boards as noted herein shall require an updated review and re-issuance of this report. DeckKorators shall notify Motus Consult Ltd. within 30 days of any material changes.

This report does not constitute a recommendation or endorsement of the product(s) evaluated hereunder.

Deck Board Name	Profile Details (NTS, dimensions in inches)
Pioneer – Solid	
Pioneer – Slotted	



Vault, Voyage, Summit & Excursion - Solid	
Vault, Voyage, Summit & Excursion - Slotted	