



Evaluation Report CCMC 14094-R

DaVinci Multi-width Slate, DaVinci Single-width Slate, DaVinci Multi-width Shake, DaVinci Single-width Shake, Bellaforté Slate, Bellaforté Shake

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “DaVinci Multi-width Slate,” “DaVinci Single-width Slate,” “DaVinci Multi-width Shake,” “DaVinci Single-width Shake,” “Bellaforté Slate” and “Bellaforté Shake,” when used as a roofing product installed over solid sheathing 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:
 - Subsection 9.26.2., Roofing Materials

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

2. Description

“DaVinci Multi-width Slate,” “DaVinci Single-width Slate,” “DaVinci Multi-width Shake,” “DaVinci Single-width Shake,” “Bellaforté Slate” and “Bellaforté Shake” are engineered polymeric plastic-based roof tiles designed to provide the look of natural slate or shake. The products are manufactured with a proprietary formulation using thermoplastic olefins and are available in assorted colors. The Slate shingles are manufactured in widths of 152 mm, 178 mm, 229 mm, 254 mm and 305 mm with a total length of 457 mm (152–203 mm of exposure depending on roof pitch and coursing). The Shake shingles are manufactured in widths of 102 mm, 152 mm, 178 mm, 203 mm and 229 mm (229-254 mm of exposure). The Bellaforté shingles are manufactured in a single width of 346 mm and are a total length of 394–413 mm (305 mm exposed).

3. Conditions and Limitations

CCMC’s compliance opinion in Section 1 is bound by the “DaVinci Multi-width Slate,” “DaVinci Single-width Slate,” “DaVinci Multi-width Shake,” “DaVinci Single-width Shake,” “Bellaforté Slate” and “Bellaforté Shake” being used in accordance with the conditions and limitations set out below:

- The products must be installed on roofs having a minimum slope of 1-in-4. The manufacturer does not recommend installation on lower slopes.
- For 3-in-12 to 4-in-12 roof slopes, DaVinci products must be installed with self-adhered waterproofing underlayment over the entire deck.
- For roof slopes greater than 4-in-12, the products must be used in conjunction with an underlayment consisting of a minimum of two layers of Type 15 or one layer of Type 30 organic felt installed in accordance with the manufacturer’s installation instructions.
- Adequate ventilation in the roof space must be provided in accordance with Article 9.19.1.1., Required Venting, of Division B of the NBC 2015.
- Existing roofing material must be torn off prior to application. The products must be applied to a clean, dry deck.
- The products must be installed over solid sheathing complying with the requirements of Subsection 9.23.16., Roof Sheathing, of Division B of the NBC 2015.
- For roof slopes greater than 6-in-12, the products must be used in conjunction with self-adhered modified bituminous eave protection complying with the requirements of Subsection 9.26.5., Eave Protection for Shingles and Shakes, of Division B of the

NBC 2015.

- The products must be installed with stainless steel, hot-dipped galvanized, solid copper, corrosion-resistant fasteners that are at least 38-mm long. The fasteners must penetrate 19 mm into wood decking or at least 5 mm through plywood or oriented strand board (OSB) sheathing.
- The products have dimpled nail pocket locations to facilitate hand nailing and the correct positioning of fasteners. Two fasteners per shingle are required, one placed in each of the nail pockets.
- The products must be installed in strict conformance with the manufacturer’s installation instructions.
- DaVinci Slate and Shake products should not be used on vertical applications or mansard roofs.
- The products or their packaging must be clearly identified with the phrase “CCMC 14094 -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 Prescriptive Requirements

Table 4.1.1 Results of Testing the Prescriptive Requirements of the Products

Property	Unit	Requirement	Result
Density	g/cm ³	Report value	1.50
Impact izod	J/m	≥ 60	274
Dimensional stability	%	Max. 5.0	Pass
Water absorption	%	Max. 3.0 (by volume)	0.0
Flexural strength	MPa	Report value	15.4
Flexural modulus	MPa	≥ 550	1151
Tensile strength	MPa	≥ 15	7.7 ⁽¹⁾
Ozone resistance	—	No visible cracks	Pass
Hardness	Barcol	Report value	9

Note to Table 4.1.1:

(1) The performance result is allowed based on full-scale wind uplift and nail pull-through test results.

4.2 Performance Requirements

Table 4.2.1 Results of Testing the Performance Requirements of the Products

Property	Requirement	Result
Acid rain	Resist sulfate ion diffusion	Pass
Dynamic impact at 23°C ± 2°C	No deleterious effects, such as cracking, flaking, etc.	Pass
Dynamic impact at -40°C ± 2°C	No deleterious effects, such as cracking, flaking, etc.	Pass
Uplift bend (optional)	DaVinci Slate	Fail ⁽¹⁾
	Davinci Shake	Fail ⁽¹⁾
	Bellaforté Slate	Pass
	Bellaforté Shake	Pass
Traffic load (N)	> 900	Pass
Nail pull through (N)	> 440	476
Accelerated weathering – flexural strength after 1 000 h of exposure (%)	90% retention of original, no defects other than colour change	91

Table 4.2.1 Results of Testing the Performance Requirements of the Products (cont.)

Property	Requirement	Result
Accelerated weathering – flexural strength after 2 000 h of exposure (%)	80% retention of original, no defects other than colour change	93
Accelerated weathering – flexural strength after 5000 h of exposure (%)	Report value	96
Heat aging – flexural strength (%)	≥ 80% retention of original	86.5
Freeze/thaw (24 cycles)	Testing not required based on water absorption test results	N/A

Note to Table 4.2.1:

(1) The product should not be used in vertical or mansard applications.

Table 4.2.2 Results of Testing the Wind Uplift Resistance of the Products

Property	Requirement	Result
Interval 1 (80 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 2 (0 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 3 (100 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 4 (0 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 5 (120 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 6 (0 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 7 (140 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 8 (0 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 9 (170 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 10 (0 km/h for 15 min)	No loss of integrity or damage noted	Pass

Table 4.2.3 Results of Testing the Dynamic Pressure of Water Infiltration of the Products

Property	Requirement	Result
Interval 1 (Wind speed 50 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 2 (Wind speed 0 km/h for 10 min)	No loss of integrity or damage noted	Pass
Interval 3 (Wind speed 100 km/h for 15 min)	No loss of integrity or damage noted	Pass
Interval 4 (Wind speed 0 km/h for 10 min)	No loss of integrity or damage noted	Pass
Interval 5 (Wind speed 140 km/h for 5 min)	No loss of integrity or damage noted	Pass
Interval 6 (Wind speed 0 km/h for 10 min)	No loss of integrity or damage noted	Pass
Interval 7 (Wind speed 170 km/h for 5 min)	No loss of integrity or damage noted	Pass
Interval 8 (Wind speed 0 km/h for 10 min)	No loss of integrity or damage noted	Pass

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