

Evaluation Report CCMC 12678-R

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HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle” when used as an exterior cladding applied to vertical walls of masonry or concrete, as well as cementitious and wood sheathing boards that are attached to wood or steel framing, in new and retrofit construction in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2005:

- Clause 1.2.1.1.(1)(a), Division A, using the following acceptable solutions from Division B:
 - Article 3.1.5.1. Noncombustible Materials
 - Sentence 5.6.1.1.(1) Required Protection from Precipitation
 - Sentence 9.27.1.1.(1) General (cladding)
 - Clause 9.27.2.2.(1)(a) Minimum Protection from Precipitation Ingress (when installed in coastal areas)
 - Sentence 9.27.2.2.(2) Minimum Protection from Precipitation Ingress
 - Sentence 9.27.2.2.(5) Minimum Protection from Precipitation Ingress
 - Article 9.27.2.3. First and Second Planes of Protection
 - Article 9.27.3.1. Elements of the Second Plane of Protection
- 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:
 - Sentence 9.27.2.1.(1) Minimizing and Preventing Ingress and Damage

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

Ruling No. 95-17-36 (12678-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 1995-11-29 pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

2. Description

The products are fibre-cement boards mainly made of hydraulic cement, silica, and other additives and reinforced integrally with cellulose fibres. The products are manufactured using the Hatschek process and steam autoclaved. They are intended for use as an exterior cladding applied to vertical walls of masonry or concrete, as well as cementitious and wood sheathing boards that are attached to wood or steel framing, in new and retrofit construction subject to the

conditions stated in Section 3 of this report. These products may be supplied unprimed or primed for subsequent application of appropriate coatings.

“HardiePanel® HZ5™ Vertical Siding”

“HardiePanel® HZ5™ Vertical Siding” are manufactured in 2438-mm- to 3658-mm-long, 1219-mm-wide, and 8-mm-thick panels. The panels are available in smooth, stucco pattern, or wood grain face texture.

Additional product lengths and widths may be available by special order from the manufacturer.

The panels are installed over wood strapping that is attached to the framing members via corrosion resistant nails. Vertical joints of the panels shall butt over studs. See manufacturer's installation instructions, dated April 2009, for details and restrictions.

“HardiePlank® HZ5™ Lap Siding”

“HardiePlank® HZ5™ Lap Siding ” are manufactured in 3658-mm-long, 102-mm- to 305-mm-wide, and 8-mm-thick planks. The planks are available in smooth or wood grain face texture.

Additional product lengths and widths may be available by special order from the manufacturer.

The planks are installed beginning from the bottom of the wall with a minimum overlap of 32 mm. Vertical joints of the planks shall butt over the framing members (studs) (see manufacturer's installation instructions, dated April 2009, for details and restrictions). The lap siding is fastened either through the overlapping planks (face-nailed) with corrosion resistant nails or screws, or through the top edge of the shingle planks (blind-nailed).

“HardieShingles® HZ5™ Notched Panel”

“HardieShingles® HZ5™ Notched Panel” is manufactured in 356-mm- to 483-mm-long, 1219-mm-wide, and 6-mm-thick panels. The panels are available in a wood grain texture.

Additional product lengths and widths may be available by special order from the manufacturer.

See manufacturer's installation instructions, dated April 2009, for details and restrictions.

“HardieShingles® HZ5™ Individual Shingles”

“HardieShingles® HZ5™ Individual Shingles” are manufactured in 457-mm-long, 152-mm- to 305-mm-wide, and 6-mm-thick cladding shingles. The shingles are available in a wood grain texture.

Additional product lengths and widths may be available by special order from the manufacturer.

See manufacturer's installation instructions, dated April 2009, for details and restrictions.

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the “HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle” being used in accordance with the conditions and limitations set out below.

- These cladding products are permitted in the construction of buildings required to be of combustible or noncombustible construction in accordance with Article 3.1.5.1. of Division B of the NBC 2005.
- At least one layer of wall sheathing membrane conforming to Article 9.27.3.2., Sheathing Membrane Material Standard, of Division B of the NBC 2005 must be applied beneath the cladding products.

- For applications in coastal areas as defined by Sentence 9.27.2.2.(5) of Division B of the NBC 2005, all listed products must be installed over wood strapping in conformance with Clause 9.27.2.2.(1)(a), Sentences 9.27.2.2.(2), and 9.27.5.7.(2), Penetration of Fasteners, and Articles 9.27.5.3., Furring, and 9.27.5.4., Size and Spacing of Fasteners, of Division B of the NBC 2005.
- “HardiePanel® HZ5™ Vertical Siding” must be installed over wood strapping in conformance with Clause 9.27.2.2.(1)(a), Sentences 9.27.2.2.(2), and 9.27.5.7.(2), Penetration of Fasteners, and Articles 9.27.5.3., Furring, and 9.27.5.4., Size and Spacing of Fasteners, of Division B of the NBC 2005, in all areas (coastal and non-coastal areas).
- For applications in coastal areas defined by Sentence 9.27.2.2.(5) of Division B of the NBC 2005, the drained and vented air space described in Clause 9.27.2.2(1)(a) of Division B of the NBC 2005 must remain unobstructed.
- The installation of the products must be limited to geographical areas where the hourly wind pressures based on a probability of being exceeded in any one year of 1 in 50 is less than 0.6 kPa ($Q_{50} < 0.6 \text{ kPa}$).
- For direct applications in non-coastal areas, the air space between the substrate and the products that is created as a result of the overlap of the cladding boards must remain unobstructed.
- For direct application of “HardiePlank® HZ5™ Lap Siding ” in non-coastal areas, the butt joint must consist of factory-finished ends in conjunction with a joint flashing behind the joint, which consists of 150-mm-wide code-prescribed sheathing membrane that overlaps the course below by 25 mm. The butt joint must load on a stud.
- Installation of the cladding products must meet the requirements of Article 9.27.3.8., Flashing Installation, and Subsections 9.27.4., Caulking, and 9.27.5., Attachment of Cladding, of Division B of the NBC 2005.
- The cladding products must be installed in conjunction with materials conforming to Articles 9.27.3.2. and 9.27.3.7., Flashing Materials, and Subsections 9.27.4. and 9.27.5. of Division B of the NBC 2005.
- The possibility of moisture accumulation within the wall construction is mainly a function of the level of workmanship related to the elements constituting the second plane of protection as defined in Article 9.27.2.3. of Division B of the NBC 2005, such as wall sheathing membrane, flashing, caulking and attachment of siding. A high level of quality control at all stages of the exterior wall construction is imperative for obtaining an acceptable performance.
- The requirements of Article 9.10.16.1, Required Fire Stops in Concealed Spaces, of Division B of the NBC 2005 must be met.
- This evaluation covers primed/unprimed/textured, uncoated or painted products. Low permeance coatings may affect the drying potential of the product as well as the substrate on which it is installed. Such a situation could lead to premature deterioration of the substrate and other elements in the wall assembly. The manufacturer’s recommendations for type and characteristics of coatings to be used in conjunction with the cladding must be followed.
- The product must be installed in accordance with the manufacturer’s current instructions dated April 2009.
- This Evaluation Report is applicable only to products identified with the following: “CCMC 12678-R.”

4. Technical Evidence

CCMC's Technical Guide for “HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle” sets out the nature of the technical evidence required by CCMC to enable it to evaluate a product as an acceptable or alternative solution in compliance with the NBC 2005. The Report Holder has submitted test results and technical data for CCMC's evaluation. Testing was conducted at independent laboratories recognized by CCMC. The corresponding test results for “HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle” are summarized below.

4.1 NBC 2005 Compliance Data for “HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingle® HZ5™ Notched Panel, and HardieShingle® HZ5™ Individual Shingle” on which CCMC Based its Opinion in Section 1

4.1.1 General

HardiePanel® HZ5™ Vertical Siding, HardiePlank® HZ5™ Lap Siding, HardieShingles® HZ5™ Notched Panel, and HardieShingles® HZ5™ Individual Shingles

Table 4.1.1.1 Test results for Material and Physical Properties

Properties	Requirements	Results
Dimensional tolerance:		
• length (mm)	± 3.0	0.1
• width (mm)		0.1
Thickness tolerance (mm)	± 1.6	0.1
Squareness (mm/m)	± 4.0	0.1
Water absorption (%) (by mass)	< 40	34.5
Density (kg/m ³)	> 950	1385

Table 4.1.1.2. Test results for Performance Requirements

Properties	Requirements	Results
Dimensional change at 50 - 90% RH (%)	< 0.20	0.09 ⁽¹⁾
Flexural strength (MPa):	> 7.0	11.1
• machine direction (wet)		7.8
• cross direction (wet)		
Fastener pull resistance (N):	> 28 Z ⁽²⁾	313
• 50 mm (2 in) 6D common		357
• 63.5 mm (2.5 in) 8D common		352
• 38 mm (1.5 in) 4D corrosion resistant		555
• 32 mm (1.25 in) 11 ga electro galvanized		469
• 50 mm (2 in) ET&F knurled ballistic		657
• #8 bulge head screw		
Freeze-Thaw Cycling	Loss of mass <3%	0.4%
(100 cycles as per ASTM C 666/C 666M-92 Method B)	Loss in flexural strength <15%	2%

Table 4.1.1.2. Test results for Performance Requirements (cont'd)

Properties	Requirements	Results
Watertightness	No formation of drops of water on underside	Passed
Warm water resistance	No visible cracks & Reduction in flexural strength <15%	Passed

Notes to Table 4.1.1.2:

- (1) After 7 days immersion.
- (2) Z is the board thickness in millimetres.

Table 4.1.1.3 Test results for Impact Resistance

Impact Body	Dynamic Mass (kg)	Energy (N·m)	Result
Safety impact			
Large soft	50	100	Passed
Hard	1	10	Passed
Retention of performance impact			
Large soft	50	34	Passed
Small soft	3	60	Passed
Hard	1	10	Passed

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Plant(s): Plant City, FL, U.S.A.
 Peru, IL, U.S.A.
 Cleburne, TX, U.S.A.
 Waxahachie, TX, U.S.A.
 Pulaski, VA, U.S.A.
 Tacoma, WA, U.S.A.
 Sparks, NV, U.S.A.
 Santiago, Chile

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