

CCMC 12416-R

CCMC Canadian code compliance evaluation

CCMC number:	12416-R
Status:	Active
Issue date:	1992-08-12
Modified date:	2022-09-20
Evaluation holder:	<p>Sto Canada Ltd. 1821 Albion Road, Unit 1–2 Etobicoke ON M9W 5W8 Canada Website: www.stocanada.com Telephone: 416-855-0460; 800-786-5234</p>
Product names:	<ul style="list-style-type: none"> • StoTherm®ci Classic • StoTherm®ci Essence • StoTherm®ci Lotusan
Code compliance:	NBC 2015, NBC 2020, OBC
Evaluation requirements:	<p><u>CAN/ULC-S716-12</u> CCMC-TG-072413.01-15B "CCMC Technical Guide for Exterior Insulation Finish Systems"</p>

In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.

[Learn more about CCMC recognition](#)

Code compliance opinion

National Building Code of Canada 2015

Code provision	Solution type
3.1.4.2.(1)(c) Protection of Foamed Plastics	<u>Acceptable</u>
3.1.5.15(2)(a) Foamed Plastic Insulation	<u>Acceptable</u>
3.1.5.5. Combustible Cladding on Exterior Walls	<u>Acceptable</u>
3.2.3.8.(1)(b) Protection of Exterior Building Face	<u>Acceptable</u>
5.6.1.1.(1) Except as provided in Sentence 5.6.1.1.(...	<u>Acceptable</u>
5.9.4. Exterior Insulation Finish Systems	<u>Acceptable</u>
5.9.4. Exterior Insulation Finish Systems	<u>Acceptable</u>
5.9.4.1. ULC CAN/ULC-S716.1-12 Exterior Insulatio ...	<u>Acceptable</u>
9.25.2.2.(1)(d) Insulation Materials	<u>Acceptable</u>
9.27.1.1.(5) Where an exterior insulation finish syst ...	<u>Acceptable</u>
9.27.2.1. Minimizing and Preventing Ingress and Damage	<u>Acceptable</u>
9.27.2.2.(1)(e) Minimum Protection from Precipitation Ingress	<u>Acceptable</u>
9.27.2.3.(1) Where walls required to provide protecti ...	<u>Acceptable</u>
9.27.3.1. Elements of the Second Plane of Protection	<u>Acceptable</u>
9.27.13. Exterior Insulation Finish Systems	<u>Acceptable</u>

National Building Code of Canada 2020

Code provision	Solution type
9.27.14.2. Materials	<u>Acceptable</u>

Ontario Building Code

Ruling No. 95-03-022 (12416-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 1995-03-02 (revised 1998-05-15) 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.

The above opinion is based on the evaluation by the CCMC of technical evidence provided by the evaluation holder, and is bound by the stated conditions and limitations. For the benefit of the user, a summary of the technical information that forms the basis of this evaluation has been included.

Product information

Product names

- StoTherm®ci Classic
- StoTherm®ci Essence
- StoTherm®ci Lotusan

Product description

The products are non-loadbearing exterior insulation and finish systems (EIFS) that can be assembled in panels under factory-controlled conditions, or field-applied. The systems are composed of the following key components:

- A water-resistive barrier (WRB);
- An adhesive;
- An insulation board; and
- A coating system (lamina).

Note: The lamina refers to all coats (base and finish) applied to the outer face of the insulation board with the glass-fibre mesh reinforcement.

The components of the systems are listed below.

Substrate

For applications falling under the scope of this Report, the substrate can be brick, masonry, monolithic concrete walls, and/or cementitious panels, glass mat surfaced gypsum boards, plywood or oriented strandboard (OSB) over wood or steel framing. Gaps between the sheathing boards of framed walls must not exceed 3.0 mm.

Water-resistive barrier (WRB)

The water resistive barrier (WRB) is a coating that is installed to provide, along with other built-in features, the second line of defence against water infiltration reaching the structure. The WRB must be applied in accordance with the product's installation manuals.

In systems with a WRB, the continuity of the second plane of protection across joints and junctions at openings, penetrations and expansion joints must be maintained through the use of accessories such as self-adhering membranes, tapes, etc., as specified by the manufacturer, prior to the installation of these systems. Furthermore, in order to provide the intended level of protection against water infiltration, the WRB must be applied in two coats with sufficient time between applications to allow the first coat to cure before the second coat is applied.

The StoGuard® coating system consists of two components: Sto Gold Fill® with StoGuard® Mesh or Sto Detail Mesh and Sto Gold Coat®, which are fluid-applied over approved substrates to provide a monolithic air and moisture barrier:

- Sto Gold Fill[®] is a water-based, flexible, trowel-applied joint compound that bridges sheathing joints and protects rough openings.
- Sto Gold Coat[®] is a ready-mixed, water-based, flexible coating for direct application to vertical above-grade wall sheathing, concrete, and concrete masonry.

Sto Flexyl is a grey polymer-modified coating that is supplied in 19-L pails and mixed on site with 50% by weight Type GU Portland cement. Sto Flexyl is applied in a continuous layer over the substrate and wrapped around the framing and penetration to achieve a minimum wet thickness of 1.5 mm.

Sto Watertight Coat is a two-component, polymer-modified coating that is supplied in 19-L pails. The wet component and grey or white powder component are mixed on-site. Sto Watertight Coat is applied in a continuous layer over the substrate and wrapped around the framing and penetration to achieve a minimum wet thickness of 1.5 mm.

Adhesive

Sto BTS[®] Plus is a one-component, polymer-modified, cement-based dry powder material used as an adhesive and supplied in 21.3-kg bags. Each bag is mixed with 4.7 L to 6.2 L of clean water. Sto BTS[®] Plus is applied as an adhesive to the inward surface of the Sto insulation board using the appropriate notched trowel. For smooth substrates such as sheathing, use a stainless steel trowel with U-shaped notches measuring 13 mm × 13 mm at 64 mm on centre (o.c.). For uneven substrates such as some types of concrete masonry, use a trowel with square notches measuring 16 mm × 16 mm at 32 mm o.c. As a base coat, the product is applied in a single continuous layer over the insulation board to achieve a minimum thickness of 1.6 mm.

Sto Primer/Adhesive is an acrylic-based emulsion supplied in 19-L pails to which an equal amount by volume of Type GU Portland Cement is added that is mixed to a uniform consistency with an electric drill and paddle. For smooth substrates such as sheathing, use a trowel with U-shaped notches measuring 13 mm × 13 mm at 64 mm o.c. For uneven substrates such as some types of concrete masonry, use a trowel with square notches measuring 16 mm × 16 mm at 32 mm o.c. or apply the product directly to the substrate using Sto Corp.'s M-8 spray pump and trowel with the appropriate notched trowel. As a base coat, the product is applied in a single continuous layer over the insulation board to achieve a minimum thickness of 1.6 mm.

Sto Primer/Adhesive B is a one-component, polymer-modified, cement-based, dry powder material supplied in 23-kg bags. Each bag is mixed with 4.7 L to 6.2 L of clean water. Sto Primer/Adhesive B is applied as an adhesive to the surface of the Sto Corp. insulation board using the appropriate notched trowel. For smooth substrates such as sheathing, use a trowel with U-shaped notches measuring 13 mm × 13 mm at 64 mm o.c. For uneven substrates such as some types of concrete masonry, use a trowel with square notches measuring 16 mm × 16 mm at 32 mm o.c., or apply the product directly to the substrate using Sto Corp.'s M-8 spray pump and trowel with the appropriate notched trowel. As a base coat, the product is applied in a single continuous layer over the insulation board to achieve a minimum thickness of 1.6 mm.

Note: Adhesives are used for bonding the insulation to the substrate coated with the WRB. They are, in general, available in the following forms: a dry powder mix that requires the addition of water on-site, a wet paste that requires the addition of cement on-site, and a form that does not require any additives. Certain adhesives are also used as base coats.

Insulation

Sto EPS Insulation Board and Sto ProD EPS Insulation Board are manufactured and packaged by Sto Corp., qualified and licensed manufacturers/molders. The expanded polystyrene foam insulation boards are aged by air for a minimum of five weeks or kiln-dried.

Sto EPS Insulation Board is a typical flat EPS board.

Sto ProD EPS Insulation Board has drainage pathways cut into the insulation that conform with Clause 9.27.13.1.(1)(b) of Division B of the NBC 2015.

The two insulation boards must conform to the following:

- CAN/ULC-S701-11, “Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering,” Type 1 or Type 2;
- Minimum board thickness: 25 mm;
- Maximum board thickness:
 - as designed, when used in combustible construction;
 - 165 mm, when used in noncombustible construction meeting Article 3.1.5.5 of Division B of the NBC 2015 for StoTherm Systems and when applied over minimum 2 × 6 wood framing covered with a minimum 12.7-mm gypsum sheathing; and
 - 140 mm, when used in noncombustible construction meeting Clause 3.2.3.8.(1)(b) of Division B of the NBC 2015 for StoTherm Systems;
- Maximum board size: 600 mm × 1 200 mm;
- Nominal density: 16 kg/m³; and
- Flame-spread rating: 25–500, per CAN/ULC-S102.2-11, “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.”

Synthetic coating system (lamina)

The synthetic coating system (lamina) consists of the reinforcing mesh, which is embedded with the base coat, a primer and a finish coat.

Base coats

When Sto BTS[®] Plus, Sto Primer/Adhesive or Sto Primer/Adhesive B (see [Adhesive](#)) is used as a base coat, it is applied with a stainless-steel trowel to the entire surface of the insulation to a uniform nominal dry-rendered thickness of 1.6 mm.

Note: The required thickness of the base coat depends on the number of layers and the type of reinforcing mesh used. The base coat is thicker when more than one layer of reinforcing mesh is incorporated into the lamina. Ultimately, it must be thick enough to fully embed the reinforcing mesh into the base coat with no mesh colour visible.

Reinforcing mesh

The reinforcing mesh is an alkali-resistant, interwoven glass-fibre reinforcing fabric having a minimum 142 g/m² nominal weight that is used with the Sto Corp. base coats and the Sto Flexyl coating. The mesh is yellow or white (where noted) and available in 107-mm, 240-mm or 970-mm wide rolls. It is available in six grades of strength:

- Sto Detail Mesh: 142 g/m², 240 mm wide
- Sto Mesh: 153 g/m², 970 mm wide
- Sto 6oz Mesh: 203 g/m², 970 mm wide
- Sto Intermediate: 373 g/m², 970 mm wide
- Sto Armor Mat: 508 g/m², 970 mm wide
- Sto Armor Mat XX: 678 g/m², 970 mm wide
- StoGuard[®] Mesh: 142 g/m², 107 mm and 240 mm wide

Primers

Sto Primer Smooth is a water-based acrylic smooth primer that provides uniform substrate absorption and finish colour and is supplied in 19-L pails. Sto Primer Smooth is applied by brush, roller or spray to the dry base coat and provides an approximately 0.1–0.15 mm wet thickness.

Sto Primer Creativ is a water-based acrylic primer supplied in 19-L pails. Sto Primer Creativ is applied by brush, roller or spray to the dry base coat and provides an approximately 0.1–0.15 mm wet thickness.

Sto Primer Sanded is a water-based acrylic sanded primer that provides uniform substrate absorption and finish colour and is supplied in 19-L pails. Sto Primer Sanded is applied by brush, roller or spray to the dry base coat and provides an approximately 0.1–0.15 mm wet thickness.

Note: Primer is typically required for spray- or roller-applied finishes.

Finish coats

Stolit[®] Lotusan is an acrylic-based textured finish coat with graded marble aggregate supplied in 19-L pails. It is factory- or store-tinted to the desired colour. Finished thickness is 1.0–1.5 mm, depending on the texture selected.

Stolit[®] is a ready-mix, acrylic-based, textured emulsion finish coat supplied in 19-L pails. It is factory- or store-tinted to the desired colour. Stolit[®] is applied with a stainless-steel trowel or spray-applied to a 1.0–3.0 mm thickness, depending on the texture selected.

StoSilco[®] Lit is a ready-mix, acrylic-based, silicone-enhanced, textured emulsion finish coat supplied in 19-L pails. It is factory- or store-tinted to the desired colour. StoSilco[®] Lit is applied with a stainless-steel trowel or spray-applied to a 1.0–1.5 mm thickness, depending on the texture selected.

Sto Essence Finish is an acrylic-based textured finish coat with graded marble aggregate and DPR technology supplied in 19-L pails. It is factory- or store-tinted to the desired colour. Finished thickness is 1.0–1.5 mm, depending on the texture selected.

Sto exterior insulation and finish system (EIFS) elements

System	Distinctive system components					
	Insulation	Intended substrate	Water-resistant barrier	Adhesive	Base coat	Finish coat
StoTherm®ci Lotusan	Sto EPS Insulation Board, Sto ProD EPS Insulation Board	Glass mat gypsum, cement board, concrete, masonry	StoGuard®, Sto Flexyl, Sto Watertight Coat	Sto BTS® Plus	Sto BTS® Plus	Stolit® Lotusan
		Plywood/OSB	StoGuard®			
StoTherm®ci Classic	Sto EPS Insulation Board, Sto ProD EPS Insulation Board	Glass mat gypsum, cement board, concrete, masonry	StoGuard®, Sto Flexyl, Sto Watertight Coat	Sto BTS® Plus	Sto BTS® Plus	Stolit®, StoSilco® Lit
		Cement board	StoGuard®			
StoTherm®ci Essence	Sto EPS Insulation Board, Sto ProD EPS Insulation Board	Concrete	StoGuard®, Sto Flexyl, Sto Watertight Coat	Sto Primer Adhesive B	Sto Primer Adhesive B	Sto Essence Finish
		Masonry	StoGuard®			
StoTherm®ci Essence	Sto EPS Insulation Board, Sto ProD EPS Insulation Board	Glass mat gypsum, cement board, concrete, masonry	StoGuard®, Sto Flexyl, Sto Watertight Coat	Sto Primer Adhesive	Sto Primer Adhesive	Sto Essence Finish
		Plywood/OSB	StoGuard®			

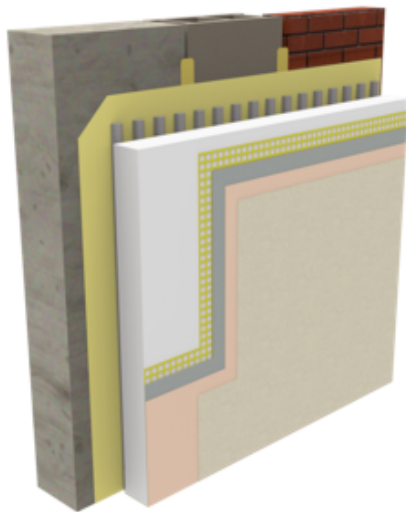


Figure 1. StoTherm®ci over concrete, concrete masonry unit and masonry

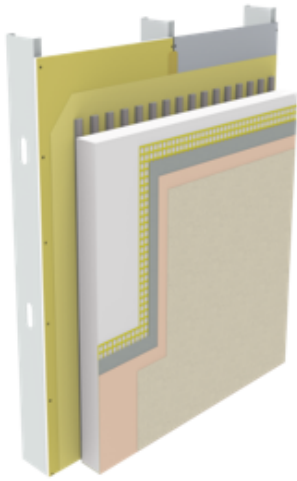


Figure 2. StoTherm®ci over glass mat gypsum or cement board over steel framing

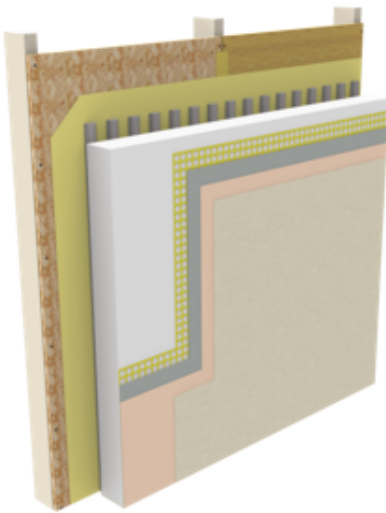


Figure 3. StoTherm®ci over wood-based sheathing-over-wood framing

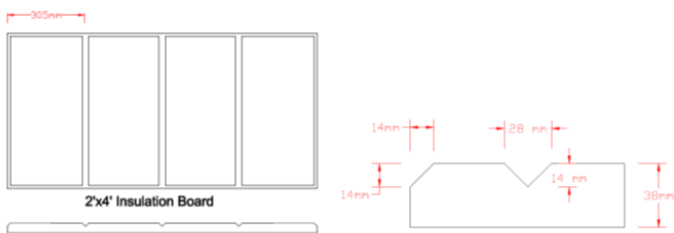


Figure 4. Geometrically-defined drainage 2 inch by 4 inch insulation board, Sto ProD EPS Insulation Board

1. 305 mm
2. 14mm
3. 14mm
4. 28mm
5. 14mm
6. 38mm

Manufacturing plants

This evaluation is limited to products produced at the following plants:

Product names	Manufacturing plants		
	Atlanta, GA, US	Glendale, AZ, US	Rutland, VT, US
StoTherm®ci Classic	◇	◇	◇
StoTherm®ci Essence	◇	◇	◇
StoTherm®ci Lotusan	◇	◇	◇

◇ Indicates that the product from this manufacturing facility has been evaluated by the CCMC

Conditions and limitations

The CCMC's compliance opinion is bound by this product being used in accordance with the conditions and limitations set out below.

- The products must only be used on the buildings complying with the requirements of the NBC 2015.
- The products are intended to be used as exterior insulation and finish wall systems (EIFS) applied directly to vertical brick, masonry or monolithic concrete walls, and/or cementitious, glass mat surfaced gypsum, plywood or OSB-sheathing boards installed over wood or steel framing.
- Gaps between the sheathing boards of framed walls must not exceed 3.0 mm.
- The products are acceptable for use on vertical walls. The systems are not acceptable for use on horizontal surfaces. (Note: The present limitation doesn't include protected soffit applications.)
- When the products are part of a prefabricated panel system that incorporates structural components, the prefabricated panel system must be designed by a professional engineer or architect in accordance with the manufacturer's criteria and the requirements of the NBC 2015.
- The products are not suitable for use as a structural sheathing for bracing purposes.
- The products are not intended for use as a below-grade insulation and should terminate at least 200 mm above grade level.
- When used in coastal areas on residential occupancies that fall under the scope of Part 9 of Division B of the NBC 2015, the products must be installed in conjunction with a capillary break conforming to Sentence 9.27.2.2.(1)(e) of Division B of the NBC 2015. Coastal areas are defined in Sentence 9.27.2.2.(5) of Division B of the NBC 2015.
- The WRB coating must be applied in two coats.
- The continuity of the second plane of protection across joints and junctions at openings, penetrations and expansion joints must be maintained through the use of accessories such as self-adhering membranes, tapes, etc., as specified by the manufacturer, prior to the installation of these systems.
- The use of the products with the adhesives indicated in the Sto Exterior Insulation and Finish System (EIFS) Elements table is limited to geographical areas where the wind-design value is $Q_{50} < 1.0$.
- When used on existing walls of sprinklered buildings or existing walls of the buildings with not more than 3 storeys, the possibility of moisture accumulation within the wall construction is mainly a function of 1) the ability of the wall assembly to deflect bulk water entry, and 2) the physical properties of the cladding being installed and its impact on the thermal, air leakage and vapour diffusion characteristics of the existing wall. The potential for moisture accumulation as a result of the addition of materials is very specific to the existing wall construction. Therefore, the installation must be in accordance with Appendix Note A-5.1.2.1(1), Application (Environmental Separation), of Division B of the NBC 2015.
- The design of the inboard/outboard insulation of the systems must be in accordance with the requirements of Section 9.25., Heat Transfer, Air Leakage and Condensation Control, of Division B of the NBC 2015.
- When the systems are used on existing walls, the addition of thermal insulation to existing exterior walls will increase the thermal efficiency and airtightness of the wall. Deficiencies in flashing and other elements in the building assembly, including mechanical systems, may result in detrimental effects of moisture accumulation as highlighted in Note A-9.25.2.4.(3), Loose-Fill Insulation in Existing Wood-Frame Walls, of Division B of the NBC 2015. As a result, existing exterior walls that are intended to be retrofitted with EIFS must meet the requirements of the NBC 2015 for heat transfer, air leakage and condensation control.
- The products can provide additional thermal insulation to the wall assembly with no detrimental effects if properly designed and installed with knowledge of the existing wall configuration and performance.

- The products alone may not provide the full amount of the required wall insulation. The thermal resistance of the wall system must conform to the energy requirements of the applicable building code. The wall system may have to conform to the National Energy Code of Canada for Buildings.
- Before cutting into insulation boards, the polystyrene thermal insulation blocks must be aged for a minimum of five weeks or kiln-dried in accordance with the requirements of Section B2.1, “Aging,” of Annex B of CAN/ULC-S701, “Thermal Insulation, Polystyrene, Boards and Pipe Covering.”
- When used in combustible construction, the polystyrene insulation must be protected from the inside of the building in accordance with Clauses 3.1.4.2.(1)(c) and 9.10.17.10.(1)(c), Protection of Foamed Plastics, of Division B of the NBC 2015.
- When used in noncombustible constructions, the polystyrene insulation must be protected from the inside of the building in accordance with Sentences 3.1.5.15.(2) and (3), Foamed Plastic Insulation, of Division B of the NBC 2015.
- The systems should be kept at least 50 mm or the distance required in applicable building regulations and safety codes from heat-emitting devices such as recessed light fixtures and chimneys.
- NBC 2015 requirements regarding fire stops must be implemented.
- The polystyrene thermal insulation must have a flame-spread rating of not more than 500 when tested in accordance with the requirements of CAN/ULC-S102.2-11, “Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.”
- Movement joints are required to accommodate expansion and contraction of building materials due to thermal changes, moisture, wind, gravity, vibration and seismic activity. Movement joints in the cladding must be used in the following situations:
 - at joints that occur in the substrate;
 - at any abutment of the system with other materials;
 - where changes in substrate might create deflection or movement;
 - where significant structural movement occurs;
 - where deflections in excess of L/240 are expected; and
 - at the floor line in wood-frame construction (this may not be required where fully-engineered framing and floor systems are used)
- Closed-cell backer rods should be used at expansion joints so that the low-modulus sealant can be installed as per the sealant manufacturer’s instructions.
- The product must be installed according to the manufacturer’s installation manual (dated no earlier than April 2015) by a trained applicator who possesses a valid manufacturer certificate for the system being installed.
- Wet materials must be applied at temperatures above 4°C and maintained above 4°C for a period not less than 24 hours. The substrate must be maintained above 4°C for a period not less than 24 hours. Cool and humid climatic conditions may extend drying time beyond 24 hours. Temporary protection and heat must be provided under colder conditions. Materials must be stored at temperatures between 5°C and 32°C. Previously frozen materials must not be used.
- Wet finished surfaces must be protected from rain and other moisture sources until sufficiently dry (set and hardened) to prevent wash-off or other moisture-related damage.
- The product must be installed with suitable flashing to drain any incidental water from the drainage cavity to the exterior and to protect the exposed top edge of the cladding. Cap flashing must be installed immediately after completion of the finish coat or temporary protection must be provided.
- Glass mat gypsum sheathing must be in compliance with the requirements of ASTM C1177 / C1177M - 11, “Glass Mat Gypsum Substrate for Use as Sheathing,” or have been evaluated by the CCMC.
- Specification of surface sealers must be provided by the manufacturer.

- OSB and/or plywood sheathing boards used in conjunction with the systems must comply with the requirements of:
 - CSA O121-08, “Douglas Fir Plywood”
 - CSA O151-09, “Canadian Softwood Plywood”
 - CSA O153-13, “Poplar Plywood”
 - CSA O325-07, “Construction Sheathing”
 - CSA O437 SERIES-93 (R2011), “OSB and Waferboard” (plywood sheathing boards) and
 - CSA O86-14, “Engineering Design in Wood”
- The OSB and/or plywood-sheathing boards must have a minimum thickness of 11.1 mm and 12.7 mm, respectively. The boards must have their principal strength direction across the studs, must be continuously supported by framing, and must be gapped at least 2.0 mm, but not more than 3.0 mm.
- OSB and/or plywood-sheathing boards used in conjunction with Class PB EIFS must be fastened to the framing in conformance with Article 9.23.3.5., Fasteners for Sheathing or Subflooring, of Division B of the NBC 2015.
- When the products are intended to be installed over wood, the lumber and/or wood sheathing must have a moisture content not greater than 19% at the time the water-resistive barrier is applied.
- When using notched-trowel-adhesive ribbons as the drainage mechanism, the application of the ribbons must be conducted in such a way as to form clear and parallel drainage paths behind the insulation boards and to avoid the creation of any V-grooves (“V-grooves” refers to ribbons touching and closing the drainage path). The wet ribbons must be a minimum of 9.0 mm deep, 9.0 mm wide and 38 mm apart.
- The drained airspace behind the insulation boards must remain unobstructed so as to form a clear drainage cavity behind the insulation board, and it must terminate in such a way so as not to obstruct the dissipation of incidental rainwater.

Technical information

This evaluation is based on demonstrated conformance with the following criteria:

Criteria number	Criteria name
CAN/ULC-S716-12	Exterior Insulation and Finish Systems (EIFS) – Materials and Systems
CCMC-TG-072413.01-15B	CCMC Technical Guide for Exterior Insulation Finish Systems

The evaluation holder has submitted technical documentation for the CCMC's evaluation. Testing was conducted at laboratories recognized by the CCMC. The corresponding technical evidence for this product is summarized below.

Material characterization

Table 1. Results of testing of ash content of the products

Property	Unit	Requirement	Result
WRB (StoGuard®)	%	Report value	
Sto Gold Fill®			75.4
Sto Gold Coat®			66.7
WRB (Sto Flexyl)			97.2
WRB (Sto Watertight Coat)			52.2
Adhesive/base coat (Sto BTS® Plus)			95.1
Adhesive/base coat (Sto Primer/Adhesive B)			95.6
Adhesive/base coat (Sto Primer/Adhesive)			86.1
Finish coat (Stolit® Lotusan)			62.8
Finish coat (Stolit®)			64.2
Finish coat (StoSilco® Lit)			64.7
Finish coat (Sto Essence Finish)			61.8

Table 2. Results of infrared analysis for documenting chemical formulation of the products

Property	Requirement	Result
WRB (StoGuard®)	Report value	Report on file
Sto Gold Fill®		
Sto Gold Coat®		
WRB (Sto Flexyl)		
WRB (Sto Watertight Coat)		
Adhesive/base coat (Sto BTS® Plus)		
Adhesive/base coat (Sto Primer/Adhesive B)		
Adhesive/base coat (Sto Primer/Adhesive)		
Finish coat (Stolit® Lotusan)		
Finish coat (Stolit®)		
Finish coat (StoSilco® Lit)		
Finish coat (Sto Essence Finish)		

Adhesion/cohesion bond

Table 3. Results of testing of adhesion bond of WRB to plywood/OSB

Property	Unit	Requirement: no detachment at bonding plane at	Result ⁽¹⁾	
StoGuard® to plywood	MPa	dry state	0.25	0.730
		2-h drying	0.08	0.447
		7-d drying	0.25	0.697
StoGuard® to OSB	MPa	dry state	0.25	0.509
		2-h drying	0.08	0.111
		7-d drying	0.25	0.289

Note:

¹ Failure within the substrate.

Table 4. Results of testing of adhesion of WRB to substrates other than plywood/OSB

Property		Unit	Requirement: no detachment at bonding plane at	Result
StoGuard® to cement board	dry state	MPa	0.25	0.635
	2-h drying		0.08	0.440
	7-d drying		0.25	0.197
StoGuard® to glass mat gypsum	dry state		0.25	0.227
	2-h drying		0.08	0.097
	7-d drying		0.25	0.118
Sto Flexyl to cement board	dry state		0.25	0.613
	2-h drying		0.08	0.419
	7-d drying		0.25	0.708
Sto Flexyl to glass mat gypsum	dry state		0.25	0.397
	2-h drying		0.08	0.125
	7-d drying		0.25	0.215
Sto Watertight coat to cement board	dry state		0.25	0.613
	2-h drying		0.08	0.419
	7-d drying		0.25	0.708
Sto Watertight coat to glass mat gypsum	dry state	0.25	0.397	
	2-h drying	0.08	0.125	
	7-d drying	0.28	0.215	

Table 5. Results of testing of adhesion/cohesion bond of WRB to substrates other than plywood/OSB

Property		Unit	Requirement: no detachment at bonding plane at	Result
StoGuard® to concrete	dry state	MPa	0.25	0.455
	2-h drying		0.08	0.551
	7-d drying		0.25	0.475

Table 6. Results of testing of adhesion bond of adhesive to WRB

Property	Unit	Requirement: no detachment at bonding plane at	Result
Sto BTS® Plus to StoGuard®	dry state	0.25	0.251
	2-h drying	0.08	0.225
	7-d drying	0.25	0.428
Sto Primer/Adhesive B to StoGuard®	dry state	0.25	0.401
	2-h drying	0.08	0.370
	7-d drying	0.25	0.447
Sto BTS® Plus to Sto Flexyl	dry state	0.25	0.3
	2-h drying	0.08	0.1
	7-d drying	0.25	0.3
Sto Primer/Adhesive B to Sto Flexyl	dry state	0.25	0.3
	2-h drying	0.08	0.1
	7-d drying	0.25	0.3
Sto BTS® Plus to Sto Watertight Coat	dry state	0.25	0.3
	2-h drying	0.08	0.1
	7-d drying	0.25	0.3
Sto Primer/Adhesive B to Sto Watertight Coat	dry state	0.25	0.3
	2-h drying	0.08	0.1
	7-d drying	0.25	0.3

Table 7. Results of testing of adhesion bond of adhesive to insulation

Property		Unit	Requirement: no detachment at bonding plane at	Result
Sto BTS® Plus to EPS	dry state	MPa	0.08	0.1
	2-h drying		0.08	0.1
	7-d drying		0.08	0.1
Sto Primer/Adhesive B to EPS	dry state		0.08	0.1
	2-h drying		0.08	0.1
	7-d drying		0.08	0.1
Sto Primer/Adhesive to EPS	dry state		0.08	0.1
	2-h drying		0.08	0.1
	7-d drying		0.08	0.1

Table 8. Results of testing of lamina bond strength (base coat/finish coat/insulation)

Property		Unit	Requirement: no detachment at bonding plane at	Result
Sto BTS® Plus/Stolit® to EPS	dry state	MPa	0.1	0.221
	2-h drying		0.1	0.143
	7-d drying		0.1	0.214
Sto Primer Adhesive/Stolit® to EPS	dry state		0.1	0.194
	2-h drying		0.1	0.103
	7-d drying		0.1	0.193

Water vapour transmission

Table 9. Results of testing of water vapour transmission (WVT) of WRB

Property	Unit	Requirement	Result
StoGuard® over OSB	ng/(Pa·s·m ²)	Report value	156 ⁽¹⁾
			78 ⁽²⁾
StoGuard® over glass-mat gypsum			321 ⁽¹⁾
			232 ⁽²⁾
Sto Flexyl over OSB			56 ⁽¹⁾
			56 ⁽²⁾
Sto Flexyl over glass-mat gypsum			187 ⁽¹⁾
			94 ⁽²⁾
Sto Watertight over OSB			56 ⁽¹⁾
			56 ⁽²⁾
Sto Watertight over glass-mat gypsum			187 ⁽¹⁾
			94 ⁽²⁾

Notes:

- 1 WVT rate measured with one-coat application.
- 2 WVT rate measured with two-coat application.

Table 10. Results of testing of water vapour transmission (WVT) of lamina

Property	Unit	Requirement	Result
Sto BTS® Plus	ng/(Pa·s·m ²)	Report value	524
Sto Primer/Adhesive B			211.8
Sto Primer/Adhesive			429

Table 11. Results of testing of water vapour transmission (WVT) of WRB and substrate

Property		Unit	Requirement	Sample no.	Result ⁽¹⁾	
					Uncoated	Coated with StoGuard®
WVT	OSB	ng/(Pa·s·m ²)	Report WVT rate of plywood and OSB coated with a WRB and of uncoated plywood and OSB	1	84.44	49.44
				2	111.25	44.84
				3	86.74	44.30
				Average	94.14	47.86
plywood				1	235.21	137.73
				2	214.22	128.73
				3	226.96	122.48
				Average	225.47	129.65

Notes:

- 1 The WVT rate of the OSB and plywood is specific to the type and thickness of the product used in the test. For typical WVT rates of OSB and plywood, see Table A-9.25.5.1.(1) of Division B of the NBC 2015.

Water absorption

Table 12. Results of testing of water absorption of base coat

Property	Unit	Requirement	Result
Sto BTS® Plus	%	≤ 20% of the dry weight	12.28
Sto Primer/Adhesive			19.37
Sto Primer/Adhesive B			17.05

Table 13. Results of testing of water absorption coefficient of WRB at 72 hours

Property	Unit	Requirement	Result
StoGuard	kg/(m ² ·s ^{1/2})	≤ 0.004	0.0003
Sto Watertight Coat			0.0013
Sto Flexyl			0.0013

Impermeability to water

Table 14. Results of testing of impermeability to water of the base coat

Property	Unit	Requirement	Result
Sto BTS® Plus	h	No water penetration in less than 2 h	Pass
Sto Primer/Adhesive B			Pass
Sto Primer/Adhesive			Pass

Water transmission resistance

Table 15. Results of testing of water transmission resistance (WTR) over OSB

Property	Unit	Requirement	Sample no.	Result
WTR	kg/m ² ·s	Five WRB-coated OSB specimens subjected to a 25-mm head of water must have a maximum average WTR rate of 2×10^{-7} kg/m ² ·s measured at 10 days	1	(1)
			2	1.87×10^{-7}
			3	9.97×10^{-8}
			4	3.25×10^{-8}
			5	1.64×10^{-7}
			Average	1.21×10^{-7}

Note:

- 1 Specimen was disregarded.

Table 16. Results of testing of water transmission resistance (WTR) over plywood

Property	Unit	Requirement	Sample No.	Result
WTR	kg/m ² ·s	Five WRB-coated plywood specimens subjected to a 25-mm head of water must have a maximum average WTR rate of 2×10^{-7} kg/m ² ·s measured at 10 days	1	(1)
			2	5.64×10^{-7}
			3	2.27×10^{-8}
			4	1.80×10^{-8}
			5	1.11×10^{-7}
			Average	1.79×10^{-7}

Note:

1 Specimen was disregarded.

Durability

Table 17. Results of testing of mildew and fungus resistance

Property	Requirement	Result
Mildew and fungus resistance of finish coat (Stolit [®] & StoSilco [®] Lit)	No growth	Pass

Table 18. Results of testing of accelerated weathering resistance

Property	Adhesive material	Applied finish	Requirement	Result
Accelerated weathering resistance of lamina @ 2 000 hrs	Sto BTS [®] Plus	Stolit [®] Finish	No cracking, flaking or deleterious effects	Pass

Table 19. Results of testing of salt spray resistance at 300 hours

Property	Requirement	Result
Sto BTS [®] Plus/Stolit	No cracking, flaking or deleterious effects	Pass
Sto Primer/Adhesive/Stolit [®]		Pass

This PDF is an alternative version. This document was published on 2022-09-20 and may not be the latest version of this evaluation. Users should consult the latest [published assessment](#) on the [CCMC Registry of Product Assessments](#), which contains the most up to date information. This PDF is intended for use as a record, not the latest information available.

Table 20. Results of testing of durability under environmental cycling conditions

Property	Unit	Requirement		Result
Pre-conditioning (drainage evaluation)	L	Report water quantity	introduced	13.5
			drained	12.59
			retained	0.91
Environmental cycling (60 cycles)	-	No cracking, blistering or sagging of base coat and no detachment or crazing of finish coat		Pass
Adhesion bond strength after environmental cycling	MPa	0.1		0.31

Table 21. Results of testing of accelerated weathering of WRB

Property	Requirement	Sample no.	Result
Sto Gold Coat®	The WRB applied over OSB must show no cracking, delamination or flaking, or any deleterious effects following 250 hours exposure to Xenon arc	1	Pass
		2	Pass
		3	Pass
		4	Pass
		5	Pass
		6	Pass

Reinforcing mesh

Table 22. Results of testing of breaking strength resistance of reinforcing mesh (142.0 g/m² (4.3 oz) – St. Gobain)

Property		Unit	Requirement	Result	
Ash content		%	Report value	14.7	
Mass per unit area		g/m ²	Report value	14	
Breaking strength resistance				Weft	Warp
Initial tensile strength		N/mm	≥ 35	37.2	40.3
Loss of tensile strength after	28-day, 3-ion soak	%	≤ 60% for adhered EIFS, ≤ 50% for mechanically fastened EIFS	17.7	7.3
Residual tensile strength after	28-day, 3-ion soak	N/mm	≥ 15 N/mm for adhered EIFS, ≥ 25 N/mm for mechanically fastened EIFS	30.6	37.3
Elongation at break	initial	%	Report value	3.3	4.1
	28-day, 3-ion soak			2.8	3.8

Impact resistance

Table 23. Results of impact resistance testing

Property		Requirement	Result
Sto BTS [®] Plus	10 joules	6/10 free-fall drops must show no perforation (broken mesh)	Pass
	3 joules	6/10 free-fall drops must show no cracks	Pass
Sto Primer/Adhesive	10 joules	6/10 free-fall drops must show no perforation (broken mesh)	Pass
	3 joules	6/10 free-fall drops must show no cracks	Pass
Sto Primer/Adhesive B	10 joules	6/10 free-fall drops must show no perforation (broken mesh)	Pass
	3 joules	6/10 free-fall drops must show no cracks	Pass

Wind load resistance

Table 24. Results of testing of wind load resistance

Reference wind pressure (kPa)	Sustained		Cycling		Gust		Deflection test		
	P ₁ , P ₁ ' (Pa)		P ₂ , P ₂ ' (Pa)		P ₃ , P ₃ ' (Pa)		Test pressure (Pa) 3.3 P ₁ , P ₁ '	Measured maximum net mid-span deflections (mm)	
								Stud span 3 050mm	Sheathing span 406 mm
Q₅₀ ≤ 0.45	±450	Pass	±660	Pass	±980	Pass	+980	5.49	1.76
							-980	-5.59	-2.35
Q₅₀ ≤ 0.55	±550	Pass	±800	Pass	±1 200	Pass	+1 200	6.72	2.16
							-1 200	-6.84	-2.88
Q₅₀ ≤ 0.65	±650	Pass	±950	Pass	±1 410	Pass	+1 410	7.90	2.54
							-1 410	-8.04	-3.38
Q₅₀ ≤ 0.75	±750	Pass	±1 090	Pass	±1 630	Pass	+1 630	9.13	2.93
							-1 630	-9.29	-3.91
Q₅₀ ≤ 0.85	±850	Pass	±1 240	Pass	±1 850	Pass	+1 850	10.36	3.33
							-1 850	-10.55	-4.44
Q₅₀ ≤ 1.00	±1 000	Pass	±1 460	Pass	±2 180	Pass	+2 180	12.21	3.92
							-2 180	-12.43	-5.23
Maximum test pressure @ L/180 deflection							+3 073	16.90	-
							-2 990	-16.90	-
Ultimate structural test pressure							+3 640	Passed	
							-3 390	Sheathing separation from steel studs occurred	

Joint disruption and relaxation resistance

Table 25. Results of testing of joint disruption resistance

Property	Unit	Requirement	Result	
			Joint width	
			2 mm	4 mm
Joint disruption resistance	-	The WRB at joints on two assemblies must show no cracking, delaminating or any other deleterious effects at a transverse bending of L/180 ⁽¹⁾	Pass	
Joint extension @ L/170 ⁽¹⁾	mm	Report value	0.51	0.73

Note:

- 1 The system's joint disruption resistance was measured at L/170, which is considered more stringent than the L/180 required by this Report.

Table 26. Results of testing of joint relaxation resistance

Property	Unit	Requirement	Sample no.	Result
Joint relaxation resistance	kg/m ² -s	Five WRB-coated OSB specimens subjected to 1.3-mm extension following exposure to 15 24-h environmental cycles must have a maximum average water transmission rate of 2×10^{-7} kg/m ² -s	1	1.14×10^{-7}
			2	8.55×10^{-8}
			3	9.29×10^{-8}
			Average	9.74×10^{-8}

Drainage capacity

Table 27. Results of testing of drainage capacity of the products

Property	Requirement	Result		
		Retained water per unit area (g/m ²)		Drainage capacity (%) after 1 h
		After 1 h	After 48 h	
Panel 1 (1)	The water retained in the unit following 48 hours of drying must not be greater than 15 g/m ² for any single test specimen	38.2	0.00	99.5
		29.4	0.00	
Panel 2 (1)	The water retained in the unit following 48 hours of drying must not be greater than 15 g/m ² for any single test specimen	35.4	0.00	99.6
		27.2	0.00	
Panel 3 (1)	The drainage capacity must not be less than 98% of the water mass delivered into the EIFS wall specimen	31.8	0.00	99.6
		24.5	0.00	

Note:

1 Panel 1, 2 and 3 consisted of the system applied over StoGuard® WRB and Sto BTS® Plus adhesive.

Nail popping resistance

Table 28. Results of testing of nail popping resistance

Property	Requirement	Sample no.	Result
Nail popping resistance	There must be no cracking or delamination of the WRB following 1-mm nail protrusion from the nail's original preset of 1 mm below the surface of the OSB substrate	1	Pass
		2	Pass
		3	Pass
		4	Pass
		5	Pass
		6	Pass

Fire testing

For a detailed description of the compliance of the related systems to the requirements of Article 3.1.5.5. of Division B of the NBC 2015, please refer to Intertek Listing Information of StoTherm®ci Lotusan, StoTherm®ci Classic, and StoTherm®ci Essence and SPEC ID: STO/WEIFS 25-01 and 25-02. Refer to STO/WEIFS 15-01 for compliance to the requirements of Clause 3.2.3.8.(1)(b) of Division B of the NBC 2015.

Administrative information

Disclaimer

This evaluation is issued by the Canadian Construction Materials Centre (CCMC), a part of the Construction Research Centre at the National Research Council of Canada (NRC). The evaluation must be read in the context of the entire [CCMC Registry of Product Assessments](#) and the legislated applicable building code in effect.

The CCMC was established in 1988 on behalf of the applicable regulator (i.e., the provinces and territories) to ensure—through assessment—conformity of alternative and acceptable solutions to regional building codes as determined by the local authority having jurisdiction (AHJ) as part of the issuance of a building permit. It is the responsibility of the local AHJs, design professionals, and specifiers to confirm that the evaluation is current and has not been withdrawn or superseded by a later issue. Please refer to [the website](#) or contact:

Canadian Construction Materials Centre
Construction Research Centre
National Research Council of Canada
1200 Montreal Road
Ottawa, Ontario, K1A 0R6
Telephone: 613-993-6189
Fax: 613-952-0268

The NRC has evaluated the material, product, system or service described herein only for those characteristics stated herein. The information and opinions in this evaluation are directed to those who have the appropriate degree of experience to use and apply its contents (i.e., AHJs, design professionals and specifiers). This evaluation is only valid when the product is installed in strict compliance with the stated conditions and limitations of evaluation and the applicable local building code. In circumstances where no applicable local building permit is issued and that no confirmation of compliance 'for use in the intended field application' is undertaken, this evaluation is null and void in all respects. This evaluation is provided without representation, warranty, or guarantee of any kind, expressed, or implied, and the NRC provides no endorsement for any evaluated material, product, system or service described herein. The NRC accepts no responsibility whatsoever arising in any way from any and all use and reliance on the information contained in this evaluation with respect to its compliance to the referenced code(s) and standard(s). The NRC is not undertaking to render professional or other services on behalf of any person or entity nor to perform any duty owed by any person or entity to another person or entity.

Language

Une version française de ce document est disponible.
In the case of any discrepancy between the English and French version of this document, the English version shall prevail.

Copyright

© 2022 Her Majesty the Queen in Right of Canada, as represented by the National Research Council of Canada.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the CCMC.

This PDF is an alternative version. This document was published on 2022-09-20 and may not be the latest version of this evaluation. Users should consult the latest [published assessment](#) on the [CCMC Registry of Product Assessments](#), which contains the most up to date information. This PDF is intended for use as a record, not the latest information available.

CCMC recognition

The Canadian Construction Materials Centre (CCMC) assesses compliance with Canadian building, energy and safety codes. We are the only construction code compliance service supported and operated by the Government of Canada. Trusted by over 6,000 regulators across Canada.

Most Canadian authorities having jurisdiction (AHJs) consider CCMC product assessments acceptable as evidence for product approval.

CCMC assessments are recognized by construction authorities across Canada:

Alliance of Canadian Building Official Associations (ACBOA)



(Alliance of Canadian Building Official Associations (ACBOA))

First Nations National Building Officers Association (FNNBOA)



(First Nations National Building Officers Association (FNNBOA))

Canadian Home Builders' Association (CHBA)



(Canadian Home Builders' Association (CHBA))

Alberta Building Officials Association (ABOA)



(Alberta Building Officials Associations (ABOA))

Saskatchewan Building Officials Association (SBOA)



(Saskatchewan Building Officials Association (SBOA))

Manitoba Building Officials Association (MBOA)



(Manitoba Building Officials Association (MBOA))

Ontario Building Officials Association (OBOA)



(Ontario Building Officials Association (OBOA))

New Brunswick Building Officials Association (NBBOA)



(New Brunswick Building Officials Association (NBBOA))

Nova Scotia Building Officials Association (NSBOA)



(Nova Scotia Building Officials Association (NSBOA))

The CCMC provides code compliance assessments to Canadian code requirements, consulting nationwide with construction regulators to elicit regional variations in code requirements as well as provincial and local interpretations. Users are advised to review the technical information presented in CCMC assessments when making approval decisions. [Learn more about how the CCMC provides a unique service for Canada.](#)

For more information, contact the CCMC by phone at (613) 993-6189 or by email at ccmc@nrc-cnrc.gc.ca

Code compliance as an acceptable solution

Code Compliance via Acceptable Solutions

If a building design (e.g. material, component, assembly or system) can be shown to meet all provisions of the applicable **acceptable solutions** in Division B (e.g. it complies with the applicable provisions of a referenced standard), it is deemed to have satisfied the objectives and functional statements linked to those provisions and thus to have complied with that part of the Code.

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(a)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Acceptable Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.

Code compliance as an alternative solution

Code Compliance via Alternative Solutions

Where a design differs from the acceptable solutions in Division B, then it should be treated as an **"alternative solution."** A proponent of an alternative solution must demonstrate that the alternative solution addresses the same issues as the applicable acceptable solutions in Division B and their attributed objectives and functional statements. However, because the objectives and functional statements are entirely qualitative, demonstrating compliance with them in isolation is not possible. Therefore, Clause 1.2.1.1.(1)(b) identifies the principle that Division B establishes the quantitative performance targets that alternative solutions must meet. In many cases, these targets are not defined very precisely by the acceptable solutions [...] Nevertheless, Clause 1.2.1.1.(1)(b) makes it clear that an effort must be made to demonstrate that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B—not “well enough” but “as well as.”

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(b)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Alternative Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.