Sto Canada Installation Guide

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1. Introduction

Evolution of EIFS

Like today's EIF systems, traditional barrier EIFS was a non-load-bearing, insulated exterior wall cladding. The 'system' consisted of an insulation board secured directly to the substrate, a reinforced base coat and a decorative and protective finish coat. Millions of square meters of traditional barrier EIFS have been installed in Canada and billions more around the world.

In the 1990s, some serious and highly publicized cases of water intrusion related to wall claddings in North America occurred, particularly in North Carolina and the lower mainland of British Columbia. While the problems were ultimately determined to be the result of badly installed or missing flashing and other interface details, barrier claddings came under close scrutiny.

As a result of these inquiries, codes were changed to emphasize the requirement for water that penetrates a wall assembly to be drained to the exterior without damage to the underlying substrate. EIFS claddings underwent significant changes to accommodate the requirements for protection and drainage. In meeting these performance requirements, EIFS now far exceed any other wall cladding in performance while maintaining all the traditional advantages of continuous insulation.

Today, a properly designed and installed EIF system consists of the following elements:

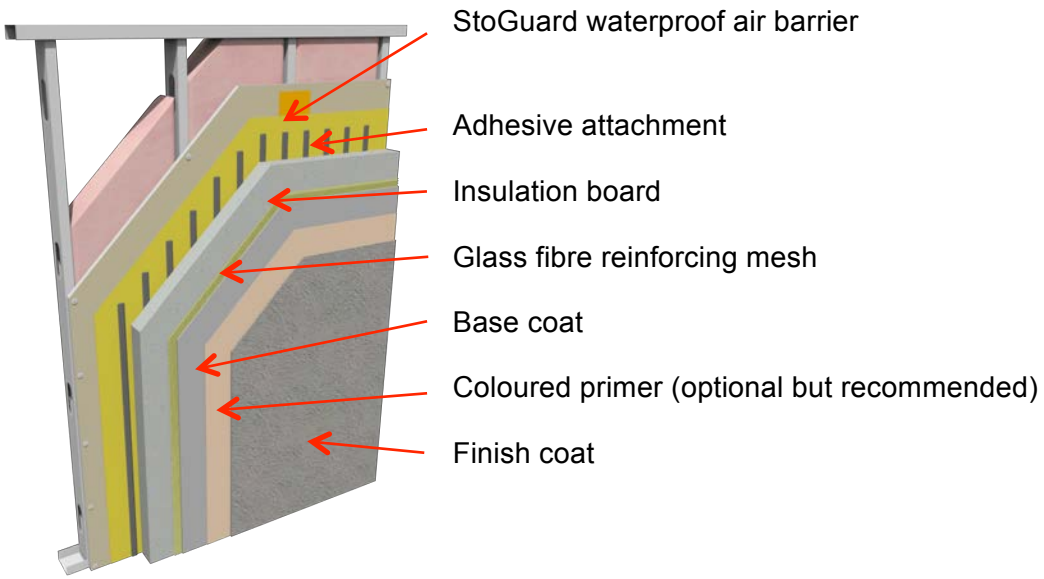


Fig. 1 StoTherm ci EIFS components

About the new codes

Installation of EIFS in Canada is governed by provincial building codes and the code-recognized evaluation agency, the Canadian Construction Materials Centre (CCMC). This will change when each province adopts the 2015 National Building Code of Canada. The

2015 code references three new EIFS standards, which will replace the requirement for a CCMC Evaluation Report. Ontario has already adopted these standards.

The new standards are:

- ULC S716.1 – A testing standard to replace the requirements of CCMC.
- ULC S716.2 – An installation standard governing how EIFS is installed.
- ULC S716.3 – A design guide for the use of EIFS.

During the transition, CCMC will continue to evaluate all EIFS to both CCMC requirements and the ULC S716 standards.

EIFS installation contractors represent a profession where quality of installation is regulated by code. The contractor and employees are responsible for knowing all the installation requirements and codes covering their project. Failure to understand and follow these requirements can result in serious consequences, including required removal and replacement of the EIFS and corrective measures at adjacent installations at the installer's expense.

Note: The adoption of ULC S716 standards into provincial building codes will allow building inspection departments to require compliance with codes, and the removal and replacement of any installation that is noncompliant.

StoTherm ci EIFS

StoTherm ci (continuous insulation) EIFS has evolved into a sophisticated insulated wall cladding that meets the National Building Code of Canada requirements for air barrier systems, moisture barriers, superior drainage capabilities and continuous insulation without thermal bridging. No other integrated cladding has performance requirements equivalent to EIFS.

StoTherm ci EIFS with StoGuard is the newest generation of EIFS. It adds a seamless waterproof air barrier behind the EIFS wall covering, making it dry by design. StoTherm ci provides the continuous insulation benefits of traditional EIFS with the added protective features of:

- secondary moisture protection
- increased resistance to air infiltration and exfiltration
- drainage of incidental moisture with vertical ribbons of adhesive
- integration of flashing with the secondary moisture protection to deflect water to the exterior.

Sto Canada wishes to provide you with as much information as possible to ensure that you, the professional installer, achieve a successful, high quality installation. The aim of this Installation Guide is to provide, in a brief form, the essential information you need to install StoTherm ci EIFS, with references to further information. The Guide was compiled with expert input from Sto technical personnel and from experienced applicators in Canada, the U.S.A. and Europe.

Your information resources

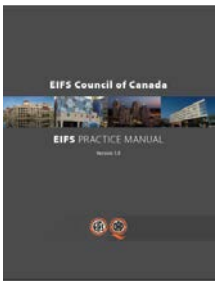
Sto Canada's website supplements all information in this Guide.

www.stocorp.ca/documentation-center.html

The website offers published instructions and a large number of videos demonstrating installation techniques for the different components. Follow the Sto installation details, instructions and specifications. All components are engineered to work together as illustrated.

Note: All materials listed in this Guide and covered on the stocorp.ca website are approved for use in Canada. Sto videos on other products are not applicable.

The comprehensive ***EIFS Practice Manual***, published by the EIFS Council of Canada, provides essential information on the three new EIFS standards. It is also an invaluable reference for EIFS design, components, and installation practice.



The manual is considered required reading for StoTherm ci EIFS installers in Canada. If writing a test for an applicator certificate, you may be asked questions based on information in the manual.

The *EIFS Practice Manual* is available to installers, architects and building officials, and can be downloaded free at:

http://eifscouncil.org/eifs-practice-manual

You must register to gain access to this site. Registration gives you automatic updates and notification of changes. There are no restrictions on copying the manual or sending out electronic copies. It is protected by copyright so you may not change it in any way, add your company name or logo to it, or charge money for copies.

Infrastructure Health & Safety Association™
Work Safe for Life

Site safety information for Canadian construction is provided at the following website:

www.ihsa.ca/WebHelp/OHSA_and_Regs.htm

As we at Sto Canada commit ourselves to manufacturing superior quality products and to innovating and introducing new technologies and products, we value and rely on your experience from the field. We hope that you will continue to share it with us. If you have any suggestions, please contact your Sto representative.

2. Project Preparation

Complete the following tasks before you begin installation to help save time and speed production.

Site safety

This is the most important part of any project. Protect your employees and yourself by staying informed of all provincial regulations and following them.

- Have the required personal safety equipment for your crew.
- Provide adequate safety training for all personnel. Some construction projects have additional site-specific regulations. Make sure you know what they are before starting, and train your crew. Violations can have serious consequences.
- Provide adequate ventilation for cold-weather enclosures to protect the crew and your work.
- Set up correct scaffolding the day before work begins. Make sure scaffolding is erected in accordance with OHSA safety regulations. Go to the following website for more information:

  www.ihsa.ca/WebHelp/OHSA_and_Regs.htm

Planning and protection

Planning ahead will save time and money. Be as prepared as possible for all the complications that arise in a construction project.

- Have a prestart meeting with the contractor and any subtrades that will be working in adjacent areas or installing components that you are required to connect to. Coordinate sequence of work and material compatibility.
- Ensure that the substrate over which you are installing the LA-WRB and EIFS is acceptable in terms of flatness and condition before you start.
- Make sure the correct materials are on the job. All EIFS materials used on the project must be from or approved by Sto.
- Notify the Sto distributor of any special materials or finishes you require in advance of the project start.
- Have scaffolding set up and material, water, and electrical power in place the day before you start work so time is not wasted when the crews arrive.
- Have weather protection arranged and ready in advance. Be prepared for unexpected rain. In colder weather be ready to have temporary heat supplied. Have plenty of thermometers in the heated enclosure to monitor temperature ranges.
- Have adequate masking and protective covering to shield areas that will be damaged by falling EIFS materials.

- Follow the installation inspection checklist to verify conformance of work to installation requirements.

See EIFS Practice Manual 4: Sample EIFS Installation Checklist.

Material storage and handling

- Sto pail products: Store and apply all pail products between 5°C (40°F) and 32°C (90°F). Store out of sunlight. Do not apply to surfaces below 5°C (40°F).
- Sto bag products: Store all bag products off the ground in a dry, cool location. Do not apply materials to frozen surfaces.
- Sto EPS insulation board: Store flat (not on edge) in a dry area. Protect from sunlight.

Record maintenance

It is strongly recommended that detailed records be kept for all projects. While we trust and plan that every project will run smoothly, problems do arise from time to time and excellent records are your best protection.

- Record all batch numbers on pails and bags of material for future reference.

  Sto batch numbers encode the following information, e.g., for **6 02 860 ####**:

  6 = last digit of the year in which shelf life will expire (i.e., 2016).
  02 = the month after which the shelf life will have expired (February)
  860 = the plant which manufactured the product (860 = Atlanta plant)
  #### = sequential batch number

- Keep a daily log of what work was done, which part of the wall was worked on, what the weather was, which materials were used and what, if any, unusual conditions were encountered.
- Retain minutes of meetings, correspondence and direction you may have received.
- Use data loggers, in cold weather and at any time when you have controlled conditions. Temperature data loggers are inexpensive and can be programmed to alert you if conditions change.
- Photograph everything.* Save the photographs on a memory stick or in computer records. Cameras are inexpensive: use one that keeps track of location, time and date.

  * 'Everything' can include site and substrate conditions, batch numbers on products being used, people on site, adjacent conditions, damage, and products being used next to your work. General photographs should accompany details of site conditions to put the details in context.

3. Substrates

Acceptable substrates

Use with **StoGuard** waterproof air barrier **only:**

- Exterior or Exposure 1 wood-based sheating (plywood, OSB)

Use with **StoGuard** and **Sto Flexyl** waterproof air barriers:

- Glass mat faced gypsum sheathing in compliance with ASTM C1177
- Water-resistant exterior fibre-reinforced gypsum sheathing panels in compliance with ASTM C1278
- Sound, clean, prepared masonry, concrete or Portland cement plaster/ stucco

Before EIFS installation begins

Substrates are not part of an EIF system. They are, of course, the support structure for the StoGuard waterproof air barrier and the starting point for a successful EIFS application. Installation of the StoGuard or the EIFS may not begin if the EIFS contractor deems the substrate to be unacceptable. Starting work on an unacceptable substrate can result in failure of the LA-WRB and delamination of the EIFS.

Requirements for acceptance of the substrate include the following:

- The structural adequacy of the substrate must meet code requirements. The EIFS installer is not responsible for determining the structural integrity of the substrate. However, if there is any question about its condition (e.g., delaminated, decayed, cracked or broken sheathing or loose, spalling or crumbling concrete or masonry), DO NOT PROCEED until the design professional has approved the supporting structure and required repairs, if any. (*See EIFS Practice Manual 2.1.2: Structural Adequacy.*)
- The installed substrate must be 'flat' in all directions, that is, with no variations over 6 mm (1/4") over a 2400 mm (8 ft.) length. The substrate is the starting condition for an acceptable finished EIFS installation. A straight and flat substrate will save on adhesives, rasping, and levelling with base coat.
- Sheathing must be free from surface defects or moisture damage. Damaged sheathing must be repaired or replaced prior to the start of work.
- Freshly poured concrete must be free of form oil, curing compounds or release agents. A detergent wash, water blasting or sandblasting is typically required to remove such surface contaminants.
- Other masonry surfaces (brick, concrete block) must be free of surface contamination such as efflorescence. Efflorescence is a white chalky deposit on the surface, caused by moisture migration through the masonry. Generally, wire brushing will remove efflorescence from masonry surfaces.
  Note: Serious efflorescence with large encrustations of lime or salts is usually

caused by a water leak. The source of the leak should be identified and corrected prior to removal of the efflorescence and installation of the water resistive barrier.

- Painted substrates must have the paint removed prior to starting the EIFS installation.
  Note: Lead-based paints may have special regulatory conditions relating to their removal and waste disposal. If there is doubt, do a lead test on the paint prior to removal.

For comprehensive information on acceptability of the substrate see EIFS Practice Manual 2.1.3: Substrate Condition, 2.1.4: Mass Wall as an EIFS Substrate and 2.1.5: Framing and Sheathing Boards as an EIFS Substrate.

When the EIFS installer has been satisfied that the substrate conditions are acceptable, the installation of the waterproof air barrier and EIFS may begin. As recommended in Part 2 – Record maintenance, details of the substrate condition should be carefully recorded. Starting work means acceptance of the substrate.

4. Waterproof Air Barrier

The all-important air barrier system

The quality of the air barrier installation can have a lasting effect on the long-term performance of the building. Air leaks through a faulty air barrier will result in substantial energy losses (recently estimated to be 40% of energy consumed by buildings in a cold climate). Mechanical systems must work harder to make up for the energy loss, resulting in increase wear. Air leaks also carry water vapour into the wall cavity. The resulting condensation can seriously compromise the durability of the building envelope and result in health and safety issues.

Even the best materials are dependent on how well they are installed. Here are some basic facts the installer should keep in mind:

- Air barrier materials must be durable and function longer than the cladding installed over them.
- Since the air barrier connects to all adjacent protective barriers, the installation sequence and issues regarding compatibility of materials must be resolved prior to the start of work.
- The barrier system and its connections must create a continuous and complete encapsulation of the building envelope, without breaks or weak spots.

Failure to properly install the waterproof air barrier can have serious consequences for the installer. Correcting air barrier mistakes after the EIFS installation is a difficult and expensive operation.

Note: The waterproof air barrier has many names, including water resistive barrier (WRB), liquid-applied water resistive barrier (LA-WRB), and sheathing membrane. The name may vary but the function is code mandated.

StoGuard liquid-applied waterproof air barrier

StoGuard starts with a liquid-applied membrane (Gold Coat or VaporSeal) which, in conjunction with connecting materials and flashing, creates a continuous, seamless waterproof air barrier beneath StoTherm ci EIF systems. The StoGuard assembly is tough and durable. It will not tear like building wraps or paper, and resists water penetration five times longer than leading building wraps and 28 times longer than conventional building paper.

StoGuard is CCMC evaluated as a stand-alone WRB and air barrier material behind *all claddings* with continuous insulation. This creates the opportunity for the installer to provide waterproof air barriers for the entire building, not just the EIFS portion.

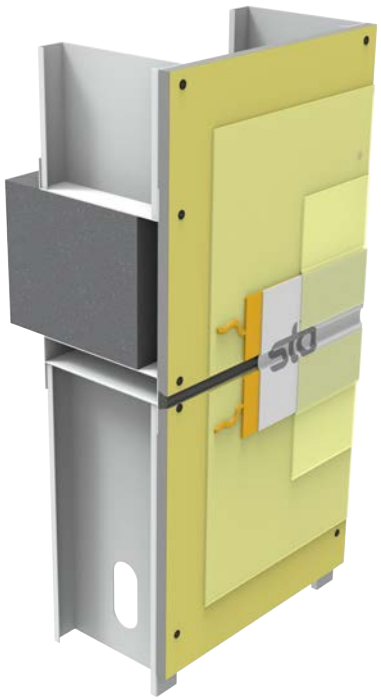
Components of the StoGuard assembly most commonly used in Canada:

StoGuard Rapid Fill – A one-component, rapid-dry air barrier and waterproof material used to seal sheathing joints, seams, cracks and transitions.

StoGuard Rapid Seal – A one-component, rapid-dry air barrier and waterproof material used to protect rough openings and transition detailing.

Sto Gold Coat – A ready-mixed flexible coating, applied directly to the sheathing and over joints filled with Sto RapidFill. Typically specified where there is a combination of interior and exterior insulation and a vapour permeable membrane is recommended.

StoGuard VaporSeal-R – A ready-mixed, flexible, waterproof air and vapour barrier membrane. Typically specified where most of the wall's insulation is provided by the EIFS and there is no separate vapour barrier in the interior of the wall.



StoGuard Transition Membrane – A flexible air barrier membrane for connecting movement joints and different substrates to achieve air barrier continuity. The membrane is set in RapidSeal for a seamless bond.

Fig.2 StoGuard Transition Membrane integrated with Sto Gold Coat

Sto Flexyl – An acrylic-based, fibre-reinforced, flexible adhesive air barrier and waterproofing for use on prepared concrete, masonry, plaster, gypsum and cement sheathing.

Sto Gold Fill – A flexible joint treatment that, combined with StoGuard Mesh or Sto Detail Mesh, is used to bridge sheathing joints, wrap building corners and protect rough openings for windows and doors.

The Sto materials listed above are air barrier system components. The complete air barrier system around the building encompasses many materials and assemblies installed by other trades.

For further information, consult the EIFS Practice Manual 2.2: Water Resistive Barrier, and the StoGuard Air Barrier Installation Manual issued by Sto Canada.

Resources for the installer

This guide provides basic information on installing StoGuard materials. More detailed information is available on the Sto website, which offers published instructions and a large number of videos demonstrating installation techniques for the different components:

www.stocorp.ca/documentation-center.html Select *videos: air moisture barriers.*

Note: All materials listed in this manual and covered on the stocorp.ca website are approved for use in Canada. Sto videos covering other products will not be applicable.

Follow the Sto installation details, instructions and specifications. All components are engineered to work together as illustrated.

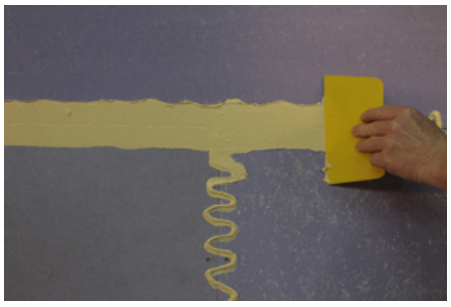
Preparing the site

StoGuard materials are designed to bond. Protect surrounding areas before installation starts. Clean up of overspray or dropped materials can be costly. If spraying Sto Gold Coat, for example, be aware of where the overspray might drift. Temporary enclosures may be advisable. Murphy's Law states that the likelihood of overspray reaching the ground is directly proportional to the cost of the automobile parked below.

Sheathing joint treatment

Prepare all sheathing joints and spot fasteners with StoGuard RapidFill. Refer to the *StoGuard RapidFill Installation Guide* for complete installation instructions and details at:

http://www.stocorp.com/files/RapidFill%20Install%20Guide%20V1%20May%202014.pdf



Gun the RapidFill in a zigzag pattern over the joint and smooth it with a DRY joint knife, spatula or trowel within 2 to 3 minutes of application. The material should be spread to create a minimum width of 25 mm (1") of material on each side of the joint, with a final wet film thickness of 0.5-0.8 mm (20-30 mils). At inside and outside corners, install the RapidFill so that it extends a minimum of 40 mm (1.5") on each side of the corner.

- Application temperatures should be between 2°C (35°F) and 27°C (80°F). RapidFill may be installed on damp surfaces and in humid conditions.
- Sheathing joints up to 12 mm (½") can be filled and sealed with RapidFill.
- Sto RapidFill may also be used to seal around penetrations in the wall assembly. Openings exceeding 12 mm (½") should be filled with urethane foam and rasped level first.
- Wall flashings installed over the StoGuard should have the top leg of the flashing sealed with a thick bead of RapidFill and tooled so that the flashing fasteners are covered and sealed.

After it has skinned over, RapidFill must be covered with Gold Coat or VaporSeal, within 48 hours of application. After 48 hours the RapidFill skin will develop characteristics that inhibit bonding with Gold Coat or VaporSeal.

Wall area treatment

The field of the wall should be coated with two applications of Gold Coat or VaporSeal. Allow the first coat to dry before the second is applied. The joint treatment may be installed before the first or second coats of Gold Coat or VaporSeal.

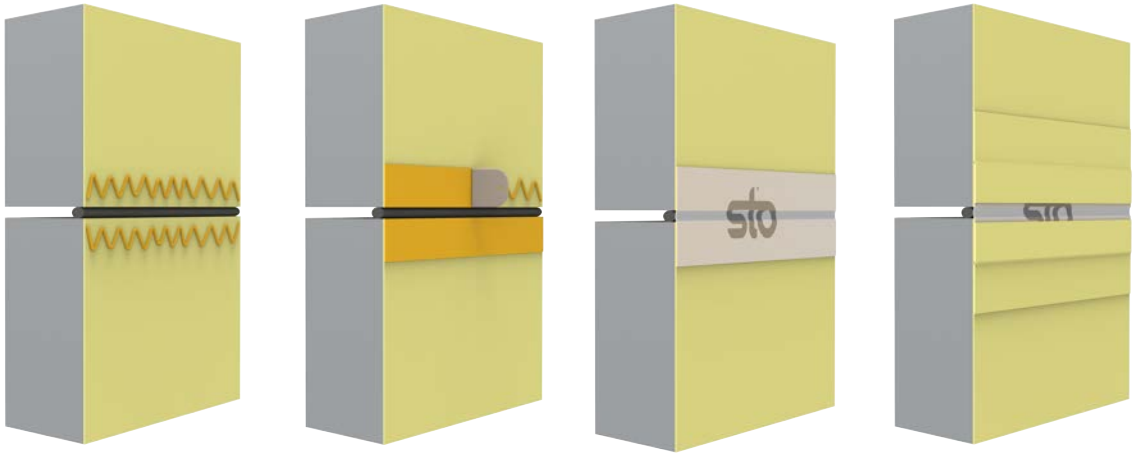
- Gold Coat – Install with a roller or airless spray gun to a wet film thickness of 0.3 mm (10 mils) per coat.
- VaporSeal – Install with a roller at 0.4 mm (15 mils) wet thickness per coat.
- Check after each application for pinholes or voids and touchup wherever required.

Note that concrete block (CMU) may require more than two coats depending on the absorbency and roughness of the block. Use RapidFill to repair all static cracks up to 12 mm (1/2") in the CMU. If cracks appear to be movement-related, consult a structural engineer prior to starting.

Movement or transition joints

Use StoGuard Transition Membrane at all points where the StoGuard meets a moving joint or different air barrier material. The membrane is installed after the Gold Coat or VaporSeal has dried. (*See fig. 3*)

A closed-cell backer rod should be compressed up to 40% and inserted into the joint prior to installing the Transition Membrane. This will provide support for the membrane during mechanical or wind pressure changes.



1. Place backer rod in joint. Gun a bead of RapidSeal on either side of the joint as shown.
2. Tool RapidSeal with a dry joint knife, spatula or trowel.
3. Within two minutes, apply Transition Membrane over the wet RapidSeal and press into place. Ensure that there are no voids in the seal.
4. Coat the Transition Membrane with Gold Coat or VaporSeal.

Fig. 3 Installation of StoGuard Transition Membrane

Rough openings

Protect rough openings with RapidSeal.

- Use a caulking gun to apply a generous bead along the surface to be protected.
- Use a drywall knife or spatula, with a 150 mm (6”) blade width, to spread the material. The tool should be dry, because RapidSeal is moisture cured.
- Apply enough material to spread it a minimum 0.3 mm (12 mils) wet thickness over the area to be protected and onto the face of the wall 100 -150 mm (4 to 6”) all the way around the opening.

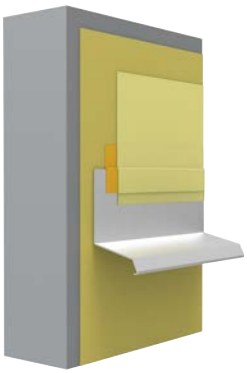
Note that the material is translucent at less than 0.3 mm thickness: this characteristic can be used as a quality assurance guide during application.

More detailed instructions are shown at:

http://www.stocorp.com/index.php/en/20090714637/videos-product/sto-videos/menu-id-272.html

Drainage and flashing

Flashing is a critical component of the waterproof barrier. Codes require that water must have a means of exiting the wall cavity and draining beyond the face of the cladding. Flashing may be a single material or composites designed to minimize thermal bridging. Flashing materials are not supplied by Sto and should be specified by the design professional as a part of the installation requirements.



As a component of the waterproof air barrier, all flashings must be integrated with the StoGuard materials so that the air barrier remains tight.

Fig. 4 StoGuard integration with flashing

Flashing materials coated with StoGuard materials add thickness to the substrate for EIFS installation. The applicator should take this into account when ordering or making pre-wrapped starter boards to be installed over flashing. Starter boards may need to be thinner to leave space for drainage while maintaining a flat wall finish.

For further information, see EIFS Practice Manual 2.2.11: Drainage and Flashing.

5. EIFS Terminations

Wrapping

EIFS terminations occur at the top and bottom of a wall, at joints, and at junctions with other materials. Wherever a termination occurs, the insulation is 'wrapped' with base coat and mesh.

Wrapping is a fire safety measure. Sto EIFS are fire-tested with the reinforcing mesh wrapped and secured to the waterproof air barrier with an adhesive layer of base coat. Building codes require installation to comply with the test method, so only methods illustrated in Sto's details are acceptable.

In addition to code compliance, wrapping base coat and mesh around the insulation provides the appropriate surface for bonding sealants (*see Part 9, Joints and Sealants).*

Three types of wrapping are used. Back-wrapping is started on the substrate before the foam is installed. Pre-wrapping is done on the foam before installation on the wall and edge wrapping is done after the foam is installed.

With the exception of ProD starter boards, use only flat stock foam for wrapping terminations.

All mesh overlaps are required to be a minimum of 65 mm (2.5") to comply with fire evaluation reports.

Back-wrapping

Back-wrapping must be used wherever the insulation system stops:

- at transitions (e.g., where insulation board meets window and door frames)
- at roofs
- at expansion joints
- at openings around meter or utility boxes, pipes, etc.
- at any other system terminations

Before insulation boards are applied to the wall, a continuous strip of reinforcing mesh is adhered to the substrate with Sto adhesive base coat. This mesh will eventually wrap around the edge of the insulation board and be embedded in base coat on the face of the board.

Using Sto adhesive base coat and strips of Sto Mesh or Detail Mesh, embed approximately 100 mm (4") of mesh into the adhesive base coat at the edge of the termination, leaving the remaining mesh to hang loosely. Allow the adhesive to cure (24 hours). Keep the loose end of the mesh free of adhesive and other debris during the curing time. This loose strip of mesh will be 'wrapped' around the insulation board edge and embedded in base coat at

a later time. Plan mesh width to achieve the minimum overlap onto the face of the insulation board.

Note: Sto Detail Mesh, a flexible mesh pre-cut in 230 mm (9”) wide rolls, is convenient for back-wrapping foam thicknesses up to 65 mm (2.5”). For greater thicknesses of insulation, custom cut wider strips of mesh.

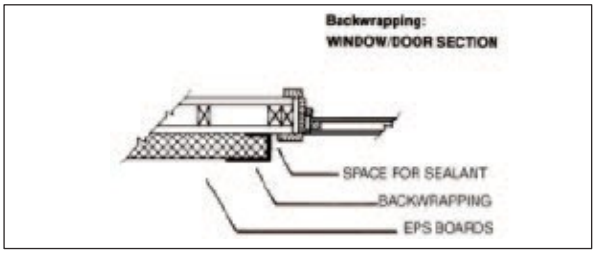
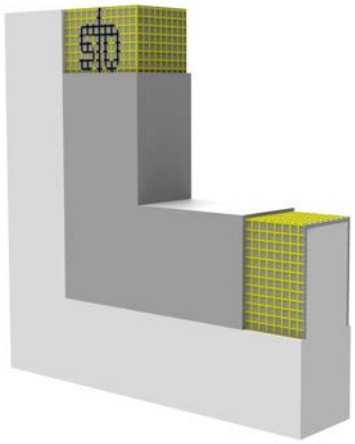


Fig. 5 Termination at door or window opening

Back-wrapping is not used at terminations designed to drain water. These terminations should be pre-wrapped with only the connecting joints back-wrapped, as shown in Fig. 8. With ProD insulation, a ProD pre-wrapped starter board should be used (*see Fig. 9*).

Pre-wrapped starter boards

Difficult profiles



An alternative to back-wrapping difficult profiles is to pre-wrap them: for example, a pre-wrapped corner is useful for openings and penetrations such as windows.

ULC S716 standards require an ‘L’ shaped piece of insulation to be installed at the corners of openings. Preparing a stock of standard pre-wrapped corners will speed the installation around openings and make finished corners neater and more precise.

Fig.6 Pre-wrapped ‘L’ corner for openings

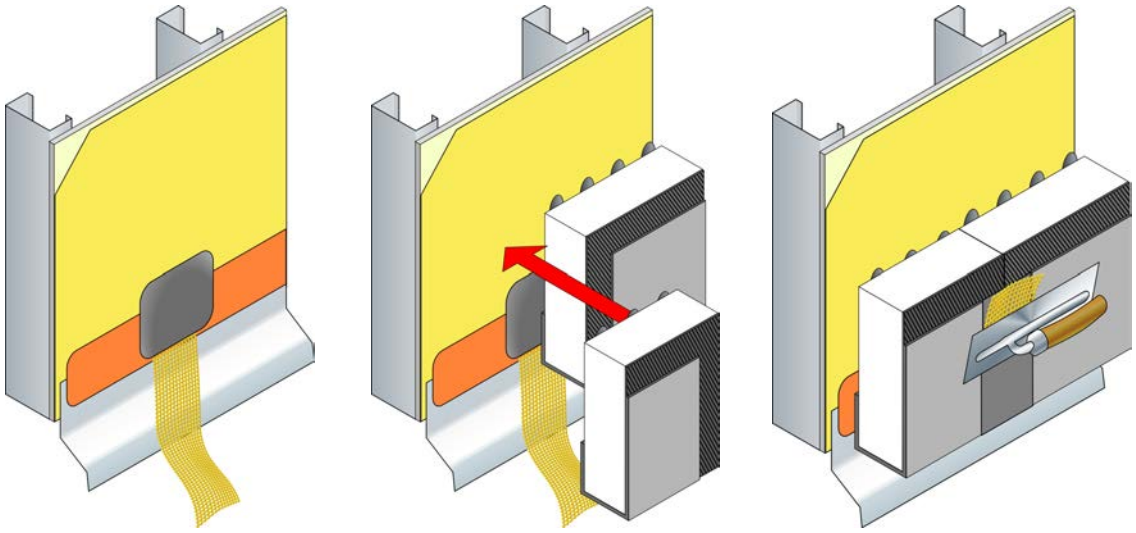
Starter boards

This is the termination method for EIFS at flashings where water is expected to drain. All EIFS starter boards are required to be pre-wrapped with mesh and base coat. ProD and other starter boards may be ordered from distributors pre-wrapped with Sto base coat and mesh (*see Fig. 10*) or they may be made by the applicator.

The starter board edge is pre-wrapped with mesh embedded in base coat. Starter boards

must be connected end-to-end with a minimum base coat and mesh overlap. Thin the base coat at the ends and along the top of the starter boards by scraping off about 35 mm so the mesh is exposed. Allow the base coat to cure. When installed on the wall, the thinned area will accommodate the mesh overlap without a buildup of base coat.

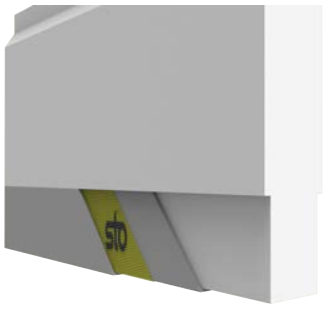
One method for connecting starter board ends is to apply a strip of detail mesh 230 mm (9”) wide to the substrate where the boards butt together. The mesh is wrapped around the ‘join’ – back-wrap fashion – and set in base coat (*see Fig. 7)*. Ultimately, the mesh in the field of the wall will overlap the top of the starter board (*see Fig. 9*). Bond the starter boards with vertical ribbons of adhesive and press into place. Do not slide them into position – sliding will close the drainage gap.



1. Trowel strip of 230 mm (9”) wide mesh into wet adhesive.
2. Press starter boards with vertical adhesive ribbons into place. Dark areas represent thinned base coat at top and ends of starter board.
3. Backwrap mesh and trowel it into wet base coat.

Fig. 7 A method for joining pre-wrapped starter boards

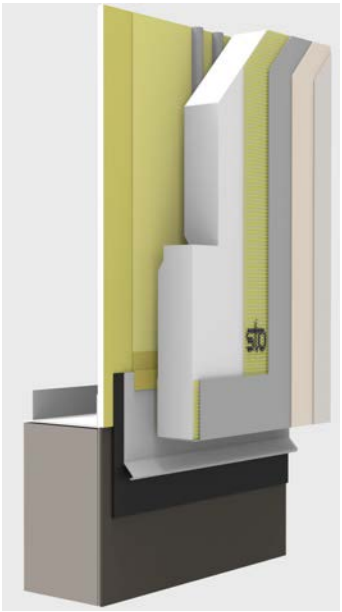
The insulation board can be slightly profiled to accommodate the additional dimensions of the flashing and WRB overlap. This is illustrated in Fig. 8, showing a cut in the insulation to receive base coat and mesh.



ProD starter board is ‘notched’ (recessed) along the bottom edge so that when pre-wrapping is complete, the embedded mesh and base coat will be flush with the plane of the foam above. This helps to maintain clearance for drainage when the insulation is being installed over flashing.

Note: Pre-wrapping with ‘sticky mesh’ *bonded directly to insulation* is not acceptable because it fails reinforce the base coat adequately.

Fig. 8 Pre-wrapped ProD starter board showing ‘notch’ with mesh embedded in base coat



Cut away illustration showing the ProD starter board over flashing with the field mesh lapped over the top edge of the pre-wrap.

It is not possible to rasp a pre-wrapped starter board to make it level with the rest of the wall. By scraping back the base coat at the top edge of the pre-wrap board during fabrication, the field overlap of 65 mm (2.5”) will not show a build-up of base coat.

Fig. 9 Pre-wrapped ProD starter board in completed EIFS installation

Edge-wrapping

After the field insulation is installed, the base coat and mesh are wrapped onto an adjacent surface such as a rough opening. This can be a termination method for door and window openings and for prefabricated panels. The edge-wrapping prevents water from passing behind the insulation and protects the edge of the sheathing.

To create an effective edge-wrap, the insulation must be flush with the edge of the opening. If the insulation is out of plane slightly, the thickness of the base coat will change at that interface and be prone to cracking. For that reason, if the substrate being wrapped is uneven, a second application of base coat and mesh may be advisable.

For more information on wrapping, see EIFS Practice Manual 2.9: Terminations and Wrapping, Figs. 20 (back-wrap), 21 (pre-wrap) and 22 (edge-wrap).

Terminations:

- The finished grade of the wall should be 200 mm (8”) below the EIFS termination. Since the position of the finished grade is usually not apparent when EIFS installation begins, be sure to confirm the grade location with the builder or general contractor prior to start.
- StoTherm EIFS should be separated a minimum of 50 mm (2”) from concrete decks, roofing materials and other exposed projecting construction. Greater separations may be required from concrete sidewalks, which move independently with frost heave.
- Vinyl starter tracks are not recommended in Canadian construction and cannot be used in noncombustible construction. Always start with a pre-wrapped starter board to allow drainage.
- Stapling or mechanical fastening the mesh to the substrate is not permitted because it does not comply with fire testing and codes.

6. Insulation Boards

The insulation used in EIFS is typically expanded polystyrene (EPS) board, although some systems use extruded polystyrene (XPS) or stone wool. This Installation guide covers EPS.

Board requirements for use in installation:

- Maximum board size allowed is 610 mm x 1220 mm (2' x 4').
- The minimum recommended thickness is 25 mm (1").
- The minimum allowed after rasping and levelling is 20 mm (0.75").
- Maximum thickness is based on fire testing performance. Currently, systems using a noncombustible base coat may be installed with up to 140 mm (5.5") of EPS.

Some decorative features for EIFS, such as cornice mouldings, are designed with greater thicknesses of insulation. Codes and fire evaluation reports do not cover these. It may be necessary to frame out the profile to maintain the 140 mm maximum thickness allowed. Check with the Sto representative before starting work on a project with features of this kind.

For further information, see EIFS Practice Manual 2.10: EIFS Mouldings.

EPS quality tests

Prior to installation, EPS boards should be checked to ensure they meet Sto specifications. All EPS boards must be produced by a Sto-licensed manufacturer and can be field-checked as follows:

Upon delivery

- EPS boards are to be delivered in yellow plastic bags labeled "Sto."
- Each bag should identify technical properties of the Sto board.
- Each board should be clearly marked with the Sto brand name and the manufacturer quality control number.
- All boards are to be wire cut (not cast formed) and the edges are to be square cut.
- Make sure the boards have not been damaged in handling.

Random sample tests

If any of the following tests 'fail', reject the insulation and contact your Sto representative or distributor.

- Proper bead fusion:

  Break a sample and examine beads: 80% of beads should be split. If beads are broken in round shapes, do not use boards.

- Proper curing:

  Break a sample and smell for pentane gas (smells like lighter fluid). If smell is present, do not use boards.

Hold a match near broken insulation. If there is a blue flash flame, do not use boards.

- Proper treatment for fire retardant:

  Test burn a sample. When the flame is removed, the insulation board should not continue to burn.

- Dimensional tolerances:

  Length, width and thickness must be true within 1.6 mm (1/16”).

  Edge trueness must not deviate more than 0.8 mm in 305 mm (1/32” in 12”).

  Surface must be flat within 0.8.mm (1/32”), measured with a straightedge.

  Squareness, when measured corner to opposing corner, must not deviate more than 0.8 mm in 305 mm (1/32” in 12”).

Sto ProD insulation

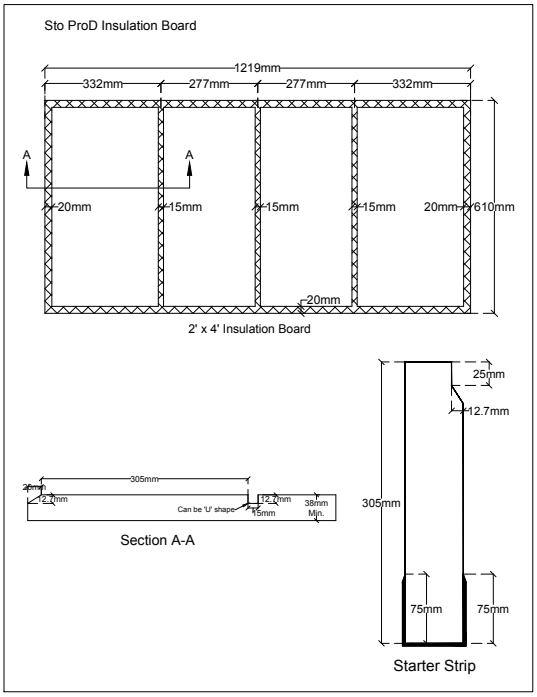
To meet the new Part 9 code requirements for residential construction in Canada and requirements of the insurer of Ontario architects, Sto Canada has introduced Sto ProD insulation. Sto ProD insulation has a geometrically defined drainage cavity (GDDC) on the interior face of the EPS board to promote draining of any water that penetrates the EIFS.

Installation of an EIFS with GDDC insulation is more complicated than a regular EIFS and the installer must be aware of the details for compartmenting.

- In any GDDC installation, the ProD insulation is only used on part of the wall face. Regular flat stock foam is used at corners, vertical terminations, and horizontal terminations at the top of a panel to restrict the movement of air and water behind the panels.
- The bottom must remain open to allow drainage via the ProD starter strip.

Review Sto details and specifications prior to starting a project with Sto ProD insulation. If you have further questions, contact your Sto representative.

See EIFS Practice Manual 2.4.5: Geometrically Defined Drainage Cavity (GDDC) Insulation.



Sto ProD insulation is patterned so that a notched trowel will fit between the grooves when applying adhesive. Sto TurboStick works well with 8 ribbons of foam.

The pattern is designed so that grooves do not have to be in alignment for effective drainage.

Do not use Sto ProD insulation at terminations where back-wrapping occurs and sealant is to be installed.

Do not install ProD insulation at inside or outside corners. At those locations install flat foam with vertical ribbons of adhesive to restrict air movement.

Fig. 10 Sto ProD insulation and starter board.

Cutting EPS boards

Commonly, EPS boards are cut with a knife, using a square to guide the cut.

Always keep the knife sharp and hold the blade at a low angle (approximately 30º or less) when cutting the board. The low angle allows the knife to 'slice' through the insulation.

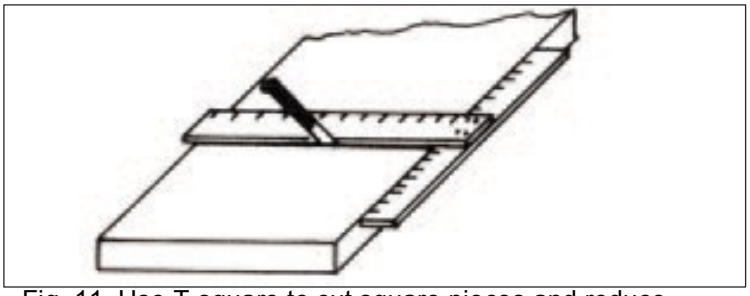


Fig. 11 Use T-square to cut square pieces and reduce slivering of gaps.

EPS boards may also be cut easily and accurately using a table saw or hot wire machine. Other tools are available commercially that may be useful for project-specific tasks such as cutting shapes.

The following steps will help save time and material on the project:

- Do an insulation board layout plan on the elevations to reduce waste and identify areas where pre-wrapped insulation can be prepared in advance of the job start.
- Note all sheathing joint locations on the layout and plan appropriate offsets. *See EIFS Practice Manual 2.4.4: Application, Fig. 9.*
- Cut insulation boards accurately. This will facilitate a tight fit on the wall and reduce the amount of time required for filling gaps between boards.
- At wrapped terminations, allow for the thickness of the base coat and mesh when calculating the 13 mm (1/2”) or 20 mm (3/4”) joint dimensions for sealant.

Adhesive application

Cementitious

Apply Sto BTS *Plus,* Sto BTS *Xtra,* Sto Primer/Adhesive-B or Sto Primer/Adhesive to the insulation board using a notched trowel. On a smooth substrate (sheathing), install Sto cementitious adhesives using a trowel with 13 mm x 13 mm (½” x ½”) ‘U’ shaped notches 50 mm (2”) apart. For uneven substrates (some masonry), use a trowel with 16 mm x 16 mm (5/8” x 5/8”) notches. Mix materials according to the instructions on the package.

Always hold the trowel at a minimum 30° angle to produce the correct size ribbons. When forming the ribbons, press the trowel firmly: this will prevent excess adhesive from collecting between the ribbons. Keep the trowel clean to prevent any adhesive build-up in the notches.

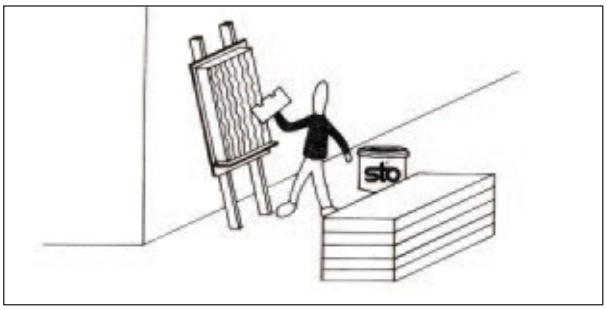


Fig. 12 Adhesive installation with notched trowel

The ribbons should run vertically (parallel to the short dimension of the board) when the boards are applied to the wall. When using Sto ProD notched insulation, apply the adhesive ribbons between the grooves in the insulation. Remove any adhesive from the grooves so water will drain freely.

To make application easier and quicker, build an ‘easel’ to hold the insulation boards as you apply the adhesive (Fig. 12). A pail placed under the easel will catch material that falls from the board, reducing waste and clean-up.

BTS *Silo* adhesive may also be applied directly to the wall using the StoSilo Combo systems.

Sto TurboStick

Sto TurboStick is a liquid polyurethane adhesive applied in ribbons to the back of the EPS board. The material is supplied in pressurized cans with hoses and an application wand. The installation technique is very different from standard cementitious adhesives, so follow the application instructions provided on the Sto website, both text and video.

Note: Coverage for Sto TurboStick will be reduced with Sto ProD insulation because an additional ribbon (8 vs. 7) is required.

For additional information on adhesives and their application, see EIFS Practice Manual 2.3: Adhesive.

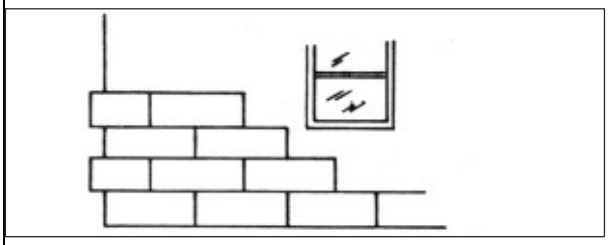
EPS board installation

Prior to placing EPS boards on the wall, wipe or scrape all adhesive from the board edges. Leaving adhesive between boards will increase the possibility of cracks developing. It will also create thermal bridges, resulting in different surface temperatures. As the wall ages dirt will accumulate in these locations, 'telegraphing' the board joint.

When applying the boards, butt them together tightly. This will prevent thermal bridges in the system and reduce the amount of slivering of gaps required later.

To maintain a clear drainage path between ribbons of adhesive, do not slide boards into place.

When placing boards on the wall, apply sufficient pressure for the adhesive to 'grab'. Tamp the board to ensure a good grab, using uniform pressure over the entire board. Use a rasping board (*see Fig.17*) or a large block of similar size to tamp boards into place so the boards are not dented or damaged. Uniform pressure with a tamping block also helps to keep the boards on a flat plane so less rasping is required to level the face of the wall.



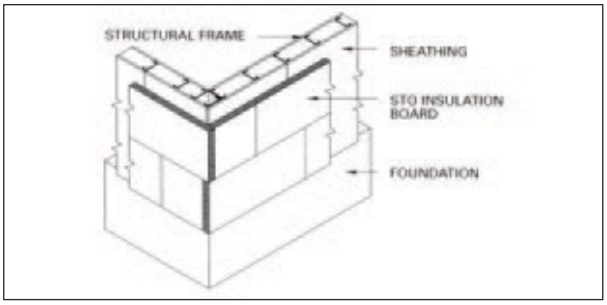
Place boards so all vertical joints are staggered a minimum 75 mm (3"). Offset all insulation joints, both vertical and horizontal, from sheathing board joints by a minimum of 150 mm (6"). This prevents cracking in the EIFS coatings in the event of movement at the sheathing joints.

Fig. 13 Offset vertical insulation board joints.

See also EIFS Practice Manual, p.30, Fig. 9 for more information on offsetting joints

Occasionally remove a board and check that there is adequate adhesive contact between

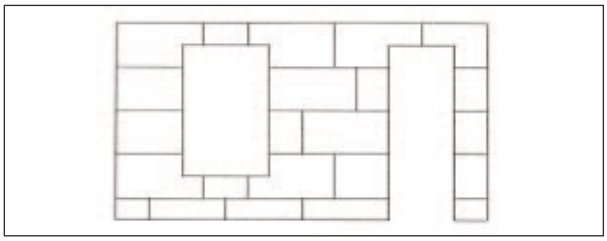
insulation and substrate and that the drainage path is clear. On rough substrates where larger ribbons are being applied, make sure there is continuous contact of the adhesive. If not, the wall may require levelling prior to installing insulation. (*See EIFS Practice Manual, p. 32 for more on checking adhesion and see Part 3: Substrates, about acceptable flatness prior to starting.*)



At inside and outside corners, always stagger or interlock the boards.

Important note: Clean adhesive off the exposed insulation at outside corners to be sure no adhesive is left between the interlocked boards.

Fig. 14 Vertical board joints staggered at outside corners



Do not align board joints with corners of openings.

The use of pre-wrapped insulation for corners will speed the installation and produce neat corners as illustrated in Fig. 7: “Pre-wrapped ‘L’ corner for openings”.

Fig. 15 Cut insulation to fit around openings

See EIFS Practice Manual 2.4.4: Application, Figs. 10 and 11.

The moisture drainage path behind EIFS, whether it be vertical adhesive ribbons or GDDC grooves, is not a substitute for flashing. *See Part 4: Drainage and Flashing.*

Filling EPS voids

As noted in the previous section, EPS boards should be butted tightly together during application. A thorough inspection should be made for any voids or spaces larger than 1.6 mm (1/16”) between the boards. (If you can slip a credit card into the void, it must be filled.) Fill joints using either low-expanding polyurethane spray foam such as Sto TurboStick or slivers of scrap EPS board.

Insulating all open joints between the boards

- eliminates thermal breaks so the wall will be properly insulated
- eliminates cracking due to excess base coat thickness
- prevents future problems with the finish due to uneven ‘vapour diffusion’
- reduces base coat consumption

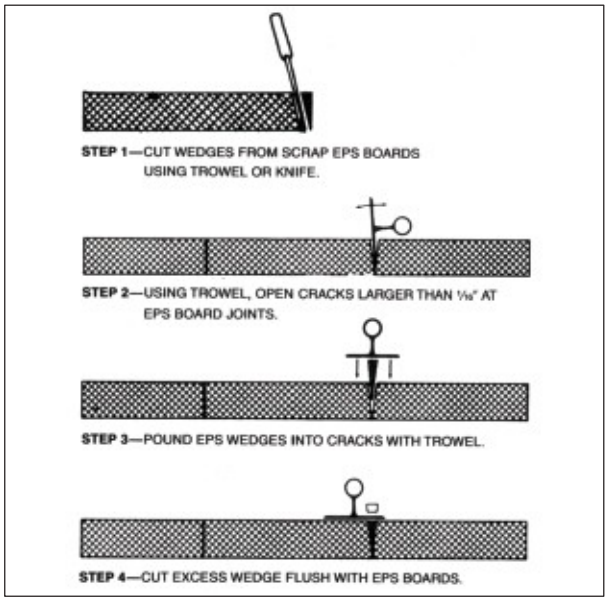


Fig. 16 How to fill gaps with an EPS sliver

ALL VOIDS MUST BE FILLED WITH AN INSULATING MATERIAL

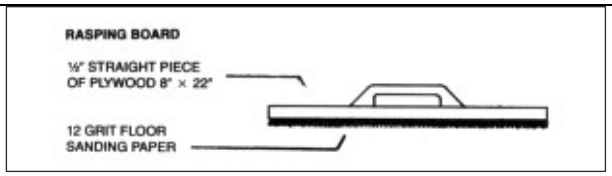
For further information on installing foam insulation, see EIFS Practice Manual 2.4.4: Application.

Rasping

Rasping the insulation must not be done for a minimum of 24 hours after installation. Premature rasping will break the bond of the adhesive.

In some conditions and with some materials, the time to rasping may change. For example, Sto TurboStick is a moisture-cure adhesive that sets up within two or three hours. Depending on time of application, this can enable rasping to be carried out on the same day the insulation is installed.

For detailed information on time to rasping, see EIFS Practice Manual 2.4.6.

	Sample rasping board made from a straight piece of 12.7 mm plywood. Also useful for tamping insulation boards in place to level them.
Fig. 17 Rasping board 200 mm x 560 mm (8" x 22")	

The entire surface of the EPS wall must be level and uniform. EPS boards are very easy to level and shape using a rasping board.

A rasping board can be made from a straight scrap of 13 mm (1/2") plywood with a wooden handle attached to one face and a piece of 12 grit floor sanding paper glued to the other face. (Floor sanding paper is approximately 200 x 560 mm (8" x 22") and should be available at local equipment rental shops.) Rasping boards are also available commercially, as are power raspers with dust containment bags.

It is important to rasp the entire surface of the insulation boards. If only the joints and/or edges are rasped, the wall will appear to have waves in it when viewed in 'critical light'.

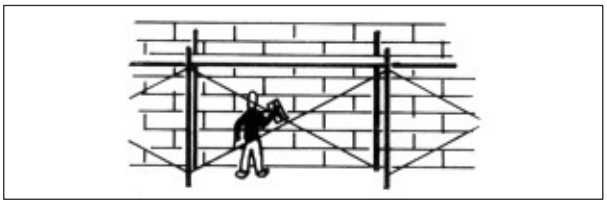


Fig. 18. Rasping EPS on the wall

Note: Rasping reduces the thickness of the insulation board. Having to rasp a wall again because of UV damage (yellow powder) may reduce the insulation thickness to less than 20 mm (3/4"), especially if ProD insulation board with a 10 mm reveal in the back has been installed. If that is the case the insulation boards will have to be replaced.

When gaps between the insulation boards have been filled and the insulation has been rasped, it is ready for the base coat application.

Note: Rasping creates EPS dust or 'snow' that can travel great distances on air currents. Environmental or waste restrictions in your area may require containment of the 'snow'.

See EIFS Practice Manual 2.4.6 for more detailed discussion on Rasping.

Aesthetic reveals

Reveals or grooves cut into the insulation for aesthetic purposes should be cut after the wall is rasped and level. Sto recommends the following:

- A 'U'-shaped profile should be used for simple reveals to reduce base coat build-up and cracking at the back of the reveal.
- All reveals should have the bottom edge sloped a minimum of 1:2 to allow water to drain and reduce dirt accumulation and streaking.
- The foam thickness must be adequate for a minimum 20 mm (3/4") of insulation remaining after rasping and reveal cutting. Note that where Sto ProD insulation is used, greater thicknesses of foam may be required. (See EIFS Practice Manual 2.4.3: Thickness, including Fig. 7.)

For more extensive discussion of reveals, see EIFS Practice Manual 2.4.8: Aesthetic Reveals, and Figs. 12 and 13.

Avoid mechanical attachment of foam insulation

Mechanical attachment is prohibited except at terminations where flashing membranes may be encountered.

- Fasteners are thermal bridges to the exterior that defeat the purpose of continuous exterior insulation. They can also 'telegraph' through the finished wall surface as the EIFS ages.
- They may limit wind load resistance of the EIF system. Adhesively fastened systems are stronger.
- Mechanical penetration through unevaluated products such as housewrap does not meet fire evaluation reports and may result in water penetration into the substrate if water is present. Mechanical attachment of EIFS over housewrap is not covered by ULC S716 EIFS standards, and has been specifically excluded by CCMC as an acceptable condition (CCMC letter 9421/07 24 13.01, 30 June 2014).

7. Base Coat & Mesh Application

Product

Install the base coat and mesh over the prepared insulation as soon as possible to protect it from UV degradation and to complete the fire protection of the insulation. If EPS board is exposed to sunlight for extended periods, a powdery yellow film develops on the surface. This film must be removed by rasping. (*See minimum thickness requirements in Section 6.*)

Use the base coat specified. Base coats are selected based on system warranty and CCMC and fire evaluation reports. Typically, the base coat is specified by the architect or designer as part of a specific StoTherm EIFS. Sto's most popular base coats and coverages are listed in Appendix A & B.

Note: Sto base coat products are highly engineered materials designed to meet the fire and durability requirements in building codes. **NEVER** add materials other than what is specifically required in the Sto mixing instructions.

Preparation

Protect all areas that may be damaged by dropped material. Sto base coat materials are ad-hesive and will stick to whatever substrate they contact (everything, except polyethylene). Cementitious base coats will damage metal if not immediately removed. All windows and projections should be masked prior to the start of base coat application. Replacing an anodized custom aluminium window can take weeks.

Mix the base coat materials as specified. Mix only enough material to be used within the specified 'pot-life' of the product. Mixed material that reaches 'pot-life' should be discarded.

Cut the reinforcing mesh in advance of the base coat application. Carefully note the areas to receive Sto Armor Mat heavy-duty reinforcement. These areas will require two applications of base coat and mesh with the heavy-duty mesh installed first. The first application must be allowed to dry, usually 24 hours, before the second application is installed.

Application at openings

Inside corner openings produce stress across the face of EIFS. Prior to installing base coat and mesh to the larger wall area, provide additional protection at door and window corners by embedding 'butterflies' or small strips of mesh into base coat diagonally at the sills and headers. This additional reinforcing will help prevent diagonal cracks at the corners. *See EIFS Practice Manual 2.6.3 and Fig. 19.*

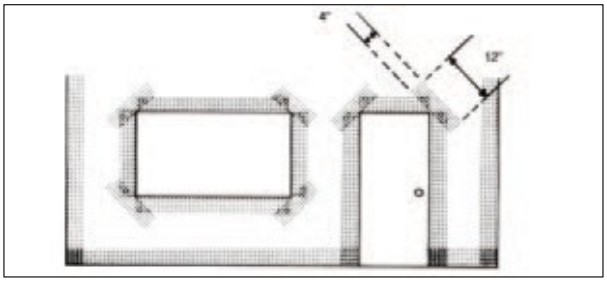


Fig. 19 Corner reinforcing

Application at corners

All inside and outside corners of the building must have two layers of mesh. This can be achieved in one of two ways:

- Double-wrap Sto Mesh a minimum of 200 mm (8”) in each direction.
- Apply Sto Detail Mesh and overlap with Sto Mesh a minimum of 200 mm (8”) onto adjacent wall.

See EIFS Practice Manual, Appendix ‘A’, Illustration 21-25 and 2.6.3: Reinforcing Mesh, Installation.

Application at wall areas

Apply Sto base coat to the insulation boards in a layer approximately 3 mm (1/8”) thick. Work vertically or horizontally in passes of 1020 mm (40”); that is, a little wider than the mesh. Immediately embed the Sto Mesh in the wet base coat.

Trowel off any excess base coat from the surface, leaving a minimum 1.6 mm (1/16”) thickness. The mesh must be fully embedded so that no mesh colour is visible. Apply additional base coat if mesh colour is visible when the base coat is dry. *See EIFS Practice Manual 2.6.3: Installation and Fig. 16.*

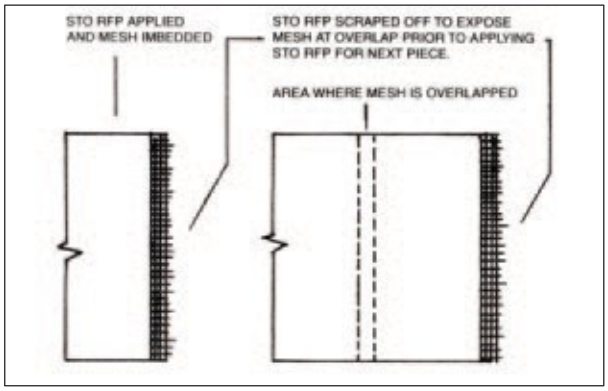


Fig. 20 Mesh overlaps on wall areas

Do not butt mesh strips. Overlap the strip edges a minimum of 65 mm (2-1/2”). Without this overlap the base coat and mesh will crack along the mesh seam. Feather the base coat at mesh overlaps.

Application for high impact areas

Where additional impact resistance is required, such as on ground floors, garage and pedestrian traffic areas, Sto recommends the use of Sto Armor Mat or Sto XX Armor Mat (ultra high impact mesh) to a minimum height of 1.8 m (6’-0”) or higher if specified. First apply a base coat layer and embed the Armor Mat. The edges of Sto Armor Mat must be butted, not overlapped, due to the thickness of the mesh. After this application has dried, apply the base coat with regular Sto Mesh, with overlaps, as previously described.

Do not substitute mesh

Reinforcing mesh is one of the most important and critically tested materials in an EIFS system. The mesh supplied by Sto meets the requirements of CCMC, ULC S716.1 and Warnock-Hersey system fire evaluations.

Sto mesh is yellow and marked to identify it. Substitution of another mesh product, no matter how similar it may appear, can have catastrophic consequences to system performance.

Building inspectors will require complete removal of a system and reinstallation if the wrong mesh is used.

See EIFS Practice Manual 2.6: Reinforcing Mesh.

8. Primer and Finish Application

Weather awareness is key

Develop your weather eye for conditions that will affect application and drying time of Sto materials. Sto primers and finishes are water-based materials that dry by evaporation. Weather conditions will have an effect on ease of installation, drying, ultimate appearance, and performance.

- During application, the temperature of both air and substrate should be a minimum of 5°C (40°F) and rising, and maintained for at least 24 hours. Note that 5°C (40°F) is an **absolute** minimum. This is the lowest temperature at which polymers can form crosslinking bonds. If they dry at cooler temperatures, the primer or finish will be powdery and will fail.
- Drying slows as humidity increases and/or temperature drops. At 100% RH, drying stops. Primers and finishes can wash off or be damaged days after installation.
- Hot, dry or windy conditions result in faster drying and possible difficulties in texturing finishes.

When in doubt provide temporary protection. Bring in supplemental heat if required.

See EIFS Practice Manual 2.1.3: Substrate Condition.

Before applying primer and finish

- The base coat and mesh application must be allowed to cure.
- Check that that all back-wrapped terminations are adequately protected with base coat and mesh.
- Protect sealant-bonding locations with masking tape prior to finish application.

Primer application

Depending on which Sto finish is specified, the ‘optional’ primer is, in practice, optional, strongly recommended or required.

Priming the base coat has several advantages:

- Priming provides uniform substrate absorption, which improves the workability of the finish in warmer temperatures and increases coverage per pail.
- Use of primer will improve the appearance of the finish colour and increase customer satisfaction.
- Primer also acts as a cement-curing agent by holding moisture in the base coat for better hydration. This will reduce the chance of efflorescence occurring.

Priming with tinted Sto primers is strongly recommended as a colour base for Stolit R finishes, and for fine aggregate finishes such as .75 mm or 1 mm finishes.

Certain finishes, specifically Sto Decocoat, Sto GraniTex, and StoCreativ Granite, always require the base coat to be primed with Sto primer, tinted to the darkest colour in the finish. These finishes have a transparent binder that relies on the primer colour showing through to enhance the final appearance.

When installing a simulated brick or stone finish where a template is used and the primer is left exposed, Sto Primer Creativ with increased UV resistance is required.

The primer is applied with a paint roller or spray to the substrate.

See further discussion on advantages of using colour primer in EIFS Practice Manual 2.7.4: Colour Primers.

Finish application

Plan the finish application so enough workers are available to finish entire sections of wall area at one time without interruption.

Mix the finish with a clean, rust-free mixer. Small amounts of clean water may be added to aid workability. Limit water to the amount needed to achieve the finish texture. Use only stainless steel trowels to apply the finish. Work in pairs, with the first person applying finish to the wall and the second person floating the finish to the proper texture.

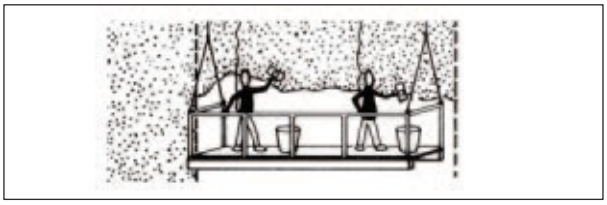


Fig. 21 Working in pairs to apply and float finish

By following the guidelines listed below and shown in the adjacent illustrations, problems can be prevented and an aesthetically pleasing wall surface will be the result.

- Apply finish directly over the base coat or primed base coat as specified only after the base coat and primer is completely dry.
- Twenty-four (24) hours minimum drying time is recommended. If cool and/or damp conditions exist, allow additional drying time, minimum 72 hours.
- Avoid application in direct sunlight. Shadows from the scaffolding cool the finish and slow the drying time. When floated the shadow cooled finish will texture differently than the rest of the wall. This difference is visible after the finish has dried. It can only be repaired by refinishing the wall.
- Apply finish in a continuous application, always working a wet edge toward the unfinished area.
- 'R' (rilled texture) finishes must be floated with a plastic trowel to achieve proper textures and avoid discolouration of the finish.
- Avoid installing separate batches of finish side-by-side (see Part 2, Record maintenance, for how to decode batch numbers).

- Interrupt application at natural breaks in construction: expansion joints, changes of plane, aesthetic reveals, system terminations, etc.

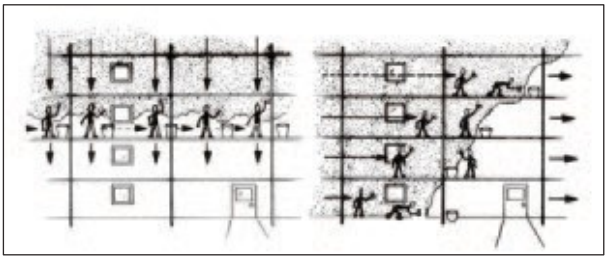


Fig. 22 Apply finish in a continuous application

Floating or spraying textures

There are several floating, spraying or trowel-applied procedures using specific Sto finishes, each producing a different type of texture. In addition, two natural 'stone' finishes are created by spraying or with a trowel.

Pebbled texture

Has a uniform aggregate size. To achieve the desired appearance with this finish, apply to the wall approximately the thickness of the aggregate. The finish is then scraped down to ensure it is no thicker than the largest aggregate size. Next, using a stainless steel trowel in a figure '8' motion, float the finish to disperse the aggregates evenly.

Note: A plastic float may be used to float this finish, but the appearance may vary from that produced with a stainless steel float.

Rilled pattern

Rilled finishes have an odd-sized aggregate that, when floated, leaves a pattern as it rolls through the wet finish. These finishes are applied to the wall to approximately the thickness of the largest aggregate. The finish is then scraped down to ensure it is no thicker than the largest aggregate size. Next, using a plastic float, float the finish in either a figure "8" or a horizontal or vertical direction to produce the rills in the finish. You can either float it immediately (wet float) or allow the finish to set a short time before floating it (dry float). The dry float technique will produce more flat areas (rills).

Note: After applying pebbled or rilled texture finishes, if the plastic or stainless steel float sticks to the finish, there is too much finish on the wall. Remove the excess by scraping with a stainless steel trowel down to the largest aggregate size. Then float the finish. This will save material and create a more uniform finish texture.

Freestyle stucco pattern

This finish uses Stolit Freeform trowel-applied to the wall in a uniform thickness and textured using a putty knife, sponge, trowel, brush or roller. Apply to a minimum thickness of 1.6 mm (1/16") and to a maximum thickness of 5.0 mm (3/16").

Limestone finish

This texture is achieved by first installing Stolit 1.0 or 1.5, then applying Stolit Freeform or Stolit Lotusan Freeform in a tight coat on top of the dry Stolit, with both products tinted to the same colour.

Stolit Milano

A versatile ready-mixed, acrylic-based exterior or interior wall finish that is both decorative and protective. It is trowel-applied as a light texture, smooth, or ultra-smooth finish. Topcoats such as StoCoat Acryl Plus and Sto Clear Coat Sealer may be applied to create a variety of decorative effects. It is intended for use over properly prepared, above grade, vertical concrete, concrete masonry, Portland cement plaster, and StoTherm ci systems.

Variegated bead texture

Sto Primer, tinted to match the darkest bead, is applied to the base coat and allowed to dry. Sto Decocoat is then applied approximately 1-1/2 times the thickness of the bead in the finish. Next, work the trowel in one direction to make the surface smooth. Press down firmly, with the trowel held nearly flat. For spray application, spray in a circular motion with proper spray equipment to achieve a smooth, uniform coating. Adjust spray pressure and orifice to achieve desired texture.

Natural stone finish using Sto GraniTex

Primer, tinted to match the darkest aggregate, is applied to the base coat and allowed to dry. Sto GraniTex is applied to the wall by spray application in two coats. Apply the first coat moving the spray vertically and the second coat moving the spray horizontally to achieve full and uniform coverage to a thickness of not less than 3.2 mm (1/8”). When the finish is dry, Sto Clear Coat Sealer is applied over the entire surface by roller.

Natural stone finish with StoCreativ Granite

Primer, tinted to match the darkest aggregate, is applied to the base coat and allowed to dry. StoCreativ Granite is trowel-applied in a thickness slightly greater than the largest aggregate in the finish. Use a flat trowel method to smooth the finish. If trowel ‘chatter’ marks appear, remove them by smoothing along the chatter mark lines.

Lightness Value

The lightness value for each Sto colour is printed on the Sto Colour Chart. A finish colour should have a lightness value of 20 or higher. The use of dark colour finishes (lightness value less than 20) over EIFS should be avoided. Dark colours absorb light energy from the sun and cause surface temperatures to increase. This can cause EPS board deformation and delamination of the EIFS base coat/mesh from the surface. The surface temperature limit of EPS board is approximately 71°C (160°F).

See also EIFS Practice Manual 2.7.7: Application.

9. Joints and Sealant

Sealant joints are not a component of the EIF system but, obviously, are required to complete the wall assembly's water shedding surface. Because sealant joints are often independent of other claddings, there can be confusion over which trade should install them. DO NOT bid or start a project without:

- clarifying beforehand which trades will supply and install sealant.
- confirming compatibility of the sealant with adjacent materials and the EIFS base coat.

Joints have two components to be considered by the installer: the waterproof air barrier behind the joint, and the outer sealant joint. The sealant installer will be required to provide drainage from the inner waterproof air barrier to the exterior (*see below*).

Sto recommends the use of a neutral-cure silicone sealant with a low modulus of elasticity. The sealant should be tested to comply with the ASTM C 1382-95 standard, which tests performance of sealant bonded to Sto base coat materials. The sealant manufacturer will recommend the correct sealant and primer for each substrate. Different substrates such as window frames and flashings may have special sealant and primer requirements. (*For further detail see EIFS Practice Manual 3.3.1: Expansion Joint Sealant.*)

Joints are installed where movement is anticipated, either at terminations with other materials or where structural movement in the building is expected. The sealant stretches like an elastic band to allow movement, while maintaining the waterproof integrity of the cladding

At terminations with other materials – door or window frames, roof, pipes, meter boxes, exterior faucets, etc. – a minimum 13 mm (1/2") wide joint for sealant must be provided.

Where expansion joints are installed to absorb structural movement, a minimum 20 mm (3/4") wide joint for sealant must be provided. Expansion joints are required in StoTherm EIFS at the following locations:

- floor lines in multi-level wood frame construction
- at dissimilar substrates, materials or construction
- where joints already exist in the substrate or supporting construction
- at changes in building height, shape or structural system
- between pre-fabricated panels
- at other areas of anticipated movement

Successful performance of the sealant depends on three careful installation practices:

- The sealant must bond to only two surfaces (such as the base coat's wrapped edge and a window frame). It should never bond to a third surface (such as the substrate). If you bond to a third surface, the "rubber band" will not be able to stretch and the sealant will crack.

- There must be enough sealant material to stretch without failure but not too much. Too much sealant will be stiff and not move as required. Confirm the best ratio of joint width to sealant thickness with the sealant manufacturer.
- The sealant must have gaps to allow water from the inner air-moisture barrier to drain to the exterior. The outer vertical sealant joint must slope in and meet the WRB so water draining behind the sealant will be directed to the exterior. Typically this occurs below horizontal joints. Leave a 25 mm (1") gap in the outer sealant to allow water to drain. (S*ee EIFS Practice Manual 3.3.5: Two-Stage Joints – Sealant and WRB System Method, and Fig. 39.)*

Typically, sealant joints are installed in combination with a closed-cell foam backer rod. The backer rod is compressed 30-40% and inserted into the joint. The fit should be tight so the backer rod will not move when sealant is pushed against it. The backer rod should be positioned so that the sealant will maintain the appropriate ratio of joint width to sealant thickness at the thinnest point. Because the backer rod is round, the sealant, when installed, will take on an 'hourglass' shape – thin in the centre of the joint and thick at the edges where it will bond. Sealant, when gunned into the joint, is immediately 'tooled', that is, finished with a tool that applies pressure to the seal and gives it a finished appearance. The applied pressure forces the sealant against the two surfaces it is to bond to, thereby ensuring a tight seal.

In some cases, the two surfaces to be sealed are not deep enough to accommodate a backer rod. In such cases, certain 'bond breaker' tapes may be used in place of a backer rod. This is also true for triangular-shaped joints, often installed at inside corners where no joint has been left for backer rod and sealant. These joints also require a bond breaker tape or a triangular backer rod to allow the joint to flex.

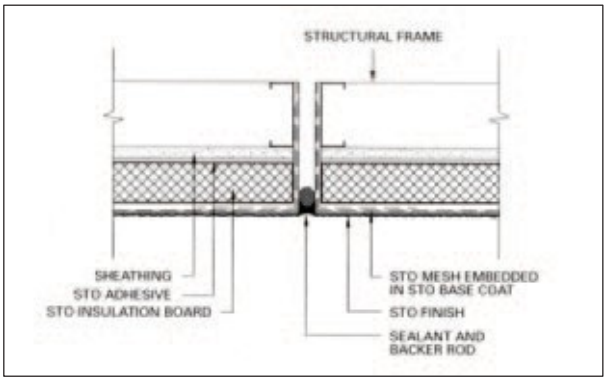


Fig. 23 Single stage barrier joint

Note: All EIFS terminations to receive sealant must be wrapped with base coat and mesh. Do not apply sealant to a textured finish. It is not possible to tool the sealant with enough force to fill the voids in the texture. Water will penetrate, the textured finish will soften and the joint will fail when stressed.

Surfaces to receive sealant may be primed with Sto Primer, tinted to match the finish. When finish is being applied to the wall, it is often not clear exactly where the finish will stop and the sealants begin. If there is a small gap between finish and sealant, tinted primer will hide the colour of the base coat, providing a more finished appearance.

Note: Occasionally there is a request made to hide the sealant joint by covering it with base coat and finish. Do not do this. The materials will not bond to the sealant and will crack and fail as the joint moves.

See EIFS Practice Manual 2.2.10: Transition Membranes and Materials, 2.2.1: Drainage and Flashing, and 3.3: Expansion Joints.

10. Failure Prevention

Moisture intrusion and critical details

Most moisture intrusion problems are not caused by material failures. They occur because of poorly designed or constructed details that allow water to enter walls rather than directing it to the exterior.

To avoid costly water intrusion problems, a few simple principles must be followed in the detailing of construction. Many of these details rely on flashing to make a leakproof transition between abutting construction elements.

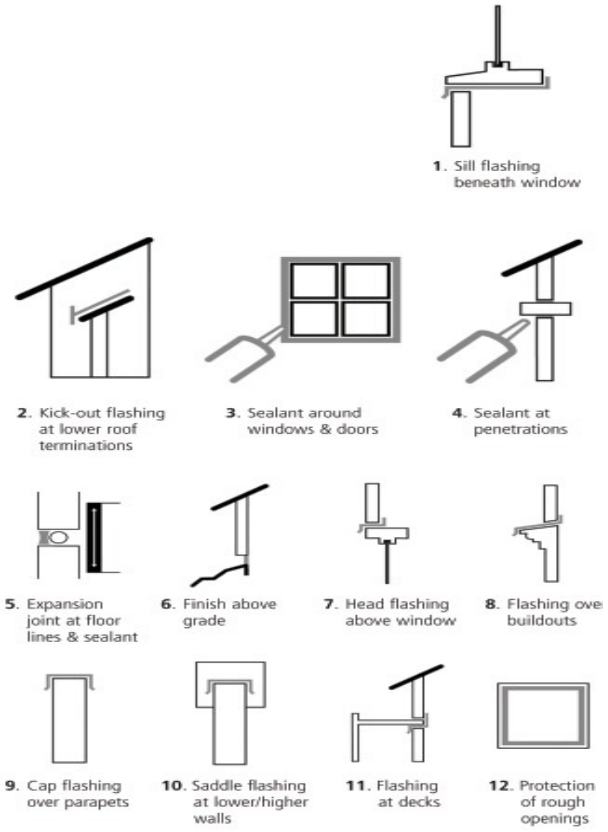


Fig. 22 Essential details

'The Nevers' or Reaping the benefits of experience

The following list of **NEVERS** was compiled from field experience and testing over the past 30 years. Observing these 'rules' helps to ensure successful installations that are durable and of high quality.

General:

1. Never deviate from published specifications.
2. Never apply StoTherm EIFS materials below 40°F (4°C).
3. Never mix additives such as rapid binders, anti-freeze accelerators, etc., with any Sto materials under any circumstances.
4. Never use any material that has not been specified by Sto.
5. Never use products that have frozen. Never apply products on frozen surfaces.
6. Never apply adhesive (except Sto Flexyl or Sto BTS Silo Adhesive) directly on the substrate. Always apply adhesive to the back of the insulation boards.
7. Never use unapproved accessories.
8. Never apply StoTherm EIFS on horizontal weather-exposed surfaces, or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. The minimum required slope is 1:2 (27 degrees), and Sto Flexyl with Sto Mesh embedded is required (*see Sto details1.04a & b*). Use flashing with a drip edge to protect large projecting EIFS features. (*See EIFS Practice Manual 2.10.1: Design Considerations*)
9. Never use StoTherm EIFS in a pool, pond, below grade (unless especially designed for use below grade) or other water-immersed condition.
10. Never use EIFS as an interior insulated finish system. Sto finishes may be used as an interior finish.
11. Never slope StoTherm EIFS trim or accents less than 27°.
12. Never direct water from roofs, decks or leaking windows into or behind the StoTherm EIFS. Always direct water to the exterior and beyond the face of the EIFS through the proper use of flashing. This is a code requirement.

Insulation:

13. Never allow adhesives or base coats to fill joints between EPS boards. Always fill EPS board joints with insulation.
14. Never allow any open joints in the insulated wall system. Always fill voids with insulation.
15. Never penetrate the insulation system with any foreign materials, such as screws, nails, etc.
16. Never use EPS board larger than 610 mm x 1220 mm (2’ x 4’) or less than 25 mm (1”) thick.
17. Never use insulation board other than Sto-specified board.
18. Never store EPS board on edge or in sunlight.
19. Never apply any product over loose EPS boards.
20. Never leave any areas of the insulation open to penetration of water or moisture. Always protect the edges of the system with base coat and mesh, then use appropriate primer and sealant.

21. Never rasp just the EPS board joints. Always rasp the entire wall surface.
22. Never allow EPS board joints to be in line with sheathing joints. Always bridge joints by a minimum of 150 mm (6”).
23. Never have less than 20 mm (3/4”) of EPS on the wall, especially when cutting aesthetic grooves and with profiled drainage insulation.

Base Coat/Mesh:

24. Never leave any areas of EPS board unprotected without mesh.
25. Never butt Sto Mesh. Always overlap it a minimum of 65 mm (2-1/2”).
26. Never overlap Sto Armor Mat. Butt the edges together and install a second layer of base coat and Sto Mesh over.
27. Never allow mesh to protrude through base coat or finish. Always apply sufficient base coat to hide the mesh colour.
28. Never apply any materials over a damp or frozen surface.
29. Never use only a single wrap of Sto Mesh on inside and outside corners. Always double wrap these areas.

Finish Coat:

30. Never apply Sto finishes thinner or thicker than recommended.
31. Never apply Sto finishes in direct sunlight.
32. Never use steel trowels. Always use stainless steel.
33. Never put finish over caulks or sealants.
34. Never put finish on horizontal weather-exposed surfaces, below grade, or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure.
35. Never use dark colours (LV less than 20) as the EIFS finish colour.

Appendix A: Part 1 StoTherm ci EIF Systems

StoTherm Lotusan ci	
	1. StoGuard Waterproof Air Barrier System 2. Sto BT Plus Adhesive applied in vertical ribbons 3. Sto EPS Insulation 25 mm to 140 mm thick* 4. Sto BTS Plus noncombustile base coat 5. Sto Mesh 6. Sto Primer – Recommended 7. Stolit Lotusan Finish * Insulation may be flat EPS board or Sto ProD profiled insulation with pre-wrapped starter board as illustrated. Minimum thickness for Sto ProD insulation is 35mm (1.5”). Sto ProD insulation meets the requirements of Part 9 Ontario Building Code.

StoTherm Classic ci	
	1. StoGuard Waterproof Air Barrier System 2. Sto BTS Plus Adhesive applied in vertical ribbons 3. Sto EPS Insulation 25 mm to 140 mm thick* 4. Sto BTS Plus noncombustile base coat 5. Sto Mesh 6. Sto Primer – Recommended and required for some finishes 7. Sto finishes * Insulation may be flat EPS board or Sto ProD profiled insulation with pre-wrapped starter board as illustrated. Minimum thickness for Sto ProD insulation is 35mm (1.5”). Sto ProD insulation meets the requirements of Part 9 Ontario Building Code.

StoTherm Essence ci NC	
	1. StoGuard Waterproof Air Barrier System 2. Sto Primer/Adhesive B Adhesive applied in vertical ribbons 3. Sto EPS Insulation 25 mm to 140 mm thick* 4. Sto Primer/Adhesive B noncombustile base coat 5. Sto Mesh 6. Sto Primer – Recommended and required for some finishes 7. Sto Essence finishes * Insulation may be flat EPS board or Sto ProD profiled insulation with pre-wrapped starter board as illustrated. Minimum thickness for Sto ProD insulation is 35mm (1.5”). Sto ProD insulation meets the requirements of Part 9 Ontario Building Code.

StoTherm Essence	
	1. StoGuard Waterproof Air Barrier System 2. Sto Primer/Adhesive applied in vertical ribbons 3. Sto EPS Insulation 25 mm to 100 mm thick* 4. Sto Primer/Adhesive base coat 5. Sto Mesh 6. Sto Primer – Recommended 7. Sto Essence finishes StoTherm Essence is suitable for combustible construction only. * Insulation may be flat EPS board or Sto ProD profiled insulation with pre-wrapped starter board as illustrated. Minimum thickness for Sto ProD insulation is 35mm (1.5”). Sto ProD insulation meets the requirements of Part 9 Ontario Building Code.

StoTherm ci EIFS with StoGuard Waterproof Air Barrier represents the culmination of years of system and materials research. Sto was the first company to produce EIFS (1963) and has been at the forefront of ‘continuous insulation’ (ci) systems ever since.

StoGuard is an advanced liquid-applied water resistive barrier (LA-WRB) system consisting of sheathing joint treatments, rough opening protection, joint membranes, and vapour permeable and impermeable membranes. When combined with StoTherm ci EIFS with vertical ribbons of adhesive, it will drain water that penetrates the EIFS with 99.8 % efficiency.

The waterproofing protection provided by StoGuard protects wall sheathing from moisture damage, both during the construction process and in the event of a breach in the EIFS wall cladding while in service. It is not intended to correct faulty workmanship, such as the absence or improper integration of flashing with the EIFS. Nor is it intended to correct other defective components of construction, such as windows that leak into the wall assembly. Flashing should always be integrated with the cladding to direct water to the exterior, not into the wall assembly, particularly at potential leak sources such as windows (*see Moisture Intrusion and Critical Details*).

As an air barrier system component, StoGuard minimizes the risk of condensation within the building envelope by eliminating mass transfer of warm moisture-laden interior air to the exterior.

Typically an air barrier system is advantageous in cold climates to prevent the passage of moisture through the wall assembly where it can condense. A complete air barrier system consists of individual air barrier components and the connections between them. The air barrier components must be continuous to become an effective air barrier system. The design/construction professional must take material compatibility and construction sequencing into account when designing an ‘air tight’ assembly to ensure continuity and long term durability. The effects of air tightness on mechanical ventilation should also be included in the overall project evaluation.

An air barrier should not be confused with a vapour retarder, which may also be used in the wall assembly to retard water vapour diffusion and reduce the risk of condensation. Generally a vapour retarder is placed on the warm side of the wall. Specifically, it is placed on the interior side in cold climates. A vapour retarder may not be necessary, depending on the wall components and the range of temperature and humidity conditions inside and outside. A vapour retarder should not be used on the inside of exterior walls in warm humid climates.

Appendix A: Part 2 StoTherm® EIFS ci Products

StoGuard® Liquid- Applied Waterproof Air Barrier

StoGuard® Rapid Fill

A one-component air barrier and waterproof material used to seal sheathing joints, seams, cracks and transitions in above grade wall construction. Rapid drying time will usually enable same day installation of other Sto air barrier components.

StoGuard® Rapid Seal

A one-component air barrier and waterproof material used to protect rough openings and transition detailing in above grade wall construction. Sto Rapid Seal is compatible with concrete, concrete masonry, brick, gypsum, sheathing, wood, cement board and galvanized metal flashing materials.

Sto Gold Coat®

A ready-mixed flexible coating that is applied by roller directly to the wall sheathing and over sheathing joints filled with Sto Gold Fill. It may also be spray applied. Sto Gold Coat may be used over exterior gypsum sheathing, Dens-Glass Gold, Aqua Tough, Exterior or Exposure 1 plywood and OSB.

StoGuard® VaporSeal™ R

A ready-mixed, flexible waterproof air and vapour barrier membrane. It is roller-applied in two coats over exterior gypsum sheathing, Dens-Glass Gold, Aqua Tough, Exterior or Exposure 1 plywood, and OSB. CMU requires two or more coats depending on the porosity of the block. Rough CMU may have to be leveled with one of Sto's base coats prior to the application.

Sto Flexyl

An acrylic-based, fibre-reinforced, flexible adhesive air barrier and waterproofing for use on prepared concrete, masonry, plaster, gypsum and cement sheathing surfaces. Combined with Portland cement, Sto Fle xyl provides multiple functions, including: air barrier, waterproof adhesive and base coat in StoTherm wall claddings. It is also used as a crack repair and foundation waterproofing material.

Sto Gold Fill®

A flexible, trowel-applied joint treatment that, combined with StoGuard Mesh or Sto Detail Mesh, bridges sheathing joints and protects rough openings for windows and doors, and building corners. Sto Gold Fill is applied to sheathing joints and a minimum of 100 mm (4") wide StoGuard Mesh or Sto Detail Mesh is immediately embedded and troweled smooth.

StoGuard® Transition Membrane

A flexible air barrier membrane for connecting open joints on vertical above grade wall construction. It is used to connect different substrates to achieve air barrier continuity. StoGuard Transition Membrane is set in Sto RapidSeal and integrated with StoGuard materials.

Adhesives and Base Coats

Sto BTS® *Plus*

A one-component, noncombustile, polymer-modified, cement-based material used as an adhesive and base coat in the StoTherm Classic NC and StoTherm Lotusan NC. BTS Plus is self-gauging to help achieve correct base coat thickness in a single coat application. It is factory-blended to ensure proper mix ratio.

Sto BTS® *Xtra*

A one-component, noncombustile, polymer-modified, lightweight, cement-based adhesive and high-build base coat for use in the StoTherm Classic NC and StoTherm Lotusan NC. It is self-gauging to help achieve correct base coat thickness in a single coat application and is lightweight, with over 17% recycled content, and buildable to 6 mm (1/4”).

Sto BTS® *Silo*

A one-component, polymer-modified, cement-based adhesive and base coat engineered for use with the StoSilo system equipment, which mixes, pumps and sprays Sto BTS-Silo for StoTherm Classic NC and StoTherm Lotusan NC. It is self-gauging to help achieve correct base coat thickness in a single coat application.

Sto Primer/Adhesive-B

A one-component, noncombustile, polymer-modified, cementitious adhesive and base coat material that is factory-blended to ensure proper mix ratio. As an adhesive, it is used to attach Sto EPS insulation board to prepared sheathing, concrete or masonry substrates, and as a base coat in StoTherm Essence NC.

Sto Primer/Adhesive

An acrylic-based adhesive and base coat material that is mixed at the job site with Portland cement in equal parts by volume and used to attach Sto EPS insulation board to prepared sheathing, concrete or masonry substrates and as a base coat in StoTherm Essence.

Sto Flexyl

An acrylic-based, fibre-reinforced, flexible waterproofing material combined with equal parts of Portland cement by weight. Sto Flexyl functions as an air and moisture barrier on concrete, masonry or gypsum-based sheathing surfaces. It also functions as a waterproof base coat in StoTherm EIFS, for use on properly sloped trim or accents and splash areas near grade. (Sto Watertight Coat is a suitable substitute for Sto Flexyl.)

Sto TurboStick™

Is a ready-to-use, single component polyurethane foam adhesive for securing Sto EPS insulation boards to prepared concrete or masonry surfaces, ASTM C-1177 compliant Glass Mat faced gypsum sheathing, Exterior or Exposure 1 wood-based sheathing and approved substrates protected with StoGuard® Waterproof Air Barrier.

Sto Primer

A ready-mixed, tinted acrylic primer for use as an undercoat with all Sto finishes to enhance colour consistency, finish coverage and finish coat adhesion, and to reduce the chance of efflorescence. Sto Primer is:

- recommended beneath Stolit R, Sto Swirl, Stolit .75, Stolit 1.0, and Sto Fine Sand finishes.
- required beneath Sto Decocoat, Sto GraniTex, and StoCreativ Granite.

Sto Primer Creativ with enhanced UV resistance is required as part of the Sto Creativ Brick System.

In most cases, Sto Primer is an optional component for use with StoTherm EIFS. The benefits of using it far outweigh the small additional cost.
Sto Primer:

- promotes uniform substrate absorption
- improves finish coat coverage and adhesion
- improves water resistance
- reduces the chance of efflorescence
- improves finish colour uniformity if tinted to match finish colour

Finishes

Stolit® Lotusan®

A ready-mixed, acrylic-based, integrally coloured, textured wall coating with Lotus-Effect® technology, used as a finish coat in StoTherm® Lotusan ci. Replicating the lotus plant's ability to shed raindrops from its leaves, Stolit Lotusan resists dirt pickup while keeping walls clean and attractive. Simply put, Stolit Lotusan walls are cleansed by rainfall.

Stolit®

A ready-mixed, acrylic-based, integrally coloured, textured wall coating used as a finish in StoTherm Classic NC. Available in a wide variety of textures and in popular and custom colours, Stolit provides a versatile decorative and protective outer layer. Enhanced by the addition of Optilink advanced polymer technology, Stolit exceeds the performance of competitors' top-line finish products for higher levels of weather, fade, mildew and dirt pick-up resistance.

Sto Essence DPR Finish

A ready-mixed, acrylic-based, integrally coloured, textured wall coating used as a finish in StoTherm Essence NC and StoTherm Essence. This attractive finish provides a versatile decorative and protective outer layer, and meets industry performance standards. Sto Essence Finish comes in popular and custom colours, and in three textures: Swirl, Medium Sand and Fine Sand.

Sto Limestone

Provides the look of smooth-cut natural limestone in an acrylic finish. It is a two-step

application of two separate Stolit finishes, either Stolit 1.0 or StoLit 1.5 as the first application, then a tight coat of Stolit Freeform or Stolit Lotusan Freeform to achieve the smooth look.

Sto Decocoat™, Sto GraniTex™, and StoCreativ® Granite

Natural-aggregate finishes in a clear acrylic matrix that provide classic looks of natural stone in a lightweight finish.

StoCreativ Brick

A lightweight wall finish that can be used with StoTherm to achieve the look of brick without the added expense and design limitations.

Other

Optilink®

Stolit finishes are improved even further with the addition of Sto Optilink, a remarkable polymer technology development by Sto that improves the curing and film formation process that occurs as these premium finishes dry. It works by forming intermolecular associations among key finish ingredients such as polymer, fillers, biocide, aggregates and pigments. Optilink acts as a 'coordinator' to help arrange, or link these primary components into a highly ordered structure.

The addition of Optilink allows Sto finishes to go beyond the performance levels of standard acrylic finishes. Film integrity and key performance properties like dirt pick-up resistance, mildew and algae resistance, and colour stability are optimized.

StoSilco® Products

These products ensure a better-looking, better-protected building with less need for cleaning and recoating. With costs comparable to those of high-quality non-silicone acrylics, StoSilco products promise unprecedented long-term value.
Advantages include:

- superior weather resistance, water-repellent
- superior vapour permeability, breathability
- superior resistance to dirt pick-up, mildew and algae
- superior UV resistance
- superior durability, less deterioration

Appendix B: Average Coverage for StoTherm EIFS Products

Conditioners	Product No.	Package	Smooth Surface	Textured surface
Sto Primer Smooth	80804	19 l pail (5 US gal.)	116 – 175 m^2 (1250 – 1885 ft^2) at 0.1-0.15 mm (4 – 6 mils) 70 – 102 m^2 (750 – 110 ft^2) at 0.2 – 0.25 mm (7 – 10 mils) *Depending on application technique*	Textured and absorbent substrates will reduce coverage
Sto Primer Sand	80801		70 – 102 m^2 (750 – 1100 ft^2)	Textured and absorbent substrates will reduce coverage
Sto Primer Creativ	80806		70 – 102 m^2 (750 – 1100 ft^2)	N/A
Sto Plex W	80831		46 – 139 m^2 (500 – 1500 ft^2)	79 – 88 m^2 (850 – 950 ft^2) *Depending on application technique*
Sto Leveler	80244	27 kg bag (60 lb.)	N/A	2.3 – 3.3 m^2 at 6 mm (25 – 35 ft^2 at 1/4") 4.6 – 6.5 m^2 at 3mm (50-70 ft^2 at 1/8")

Adhesives	Product No.	Package	Sheathing or smooth concrete	Irregular block, concrete, brick
Sto BTS Plus	80727	21.3 kg bag (47 lb.)	*Through the wall:* 5.1 – 7.0 m^2 (55 – 75 ft^2) *As adhesive ribbons 13 x 13mm (½" x ½") notched trowel:* 8.4 – 12.5 m^2 (90 – 135 ft^2)	*As an adhesive with 16 x 16 mm (5/8" x 5/8") square notched trowel:* 2.8 – 4.2 m^2 (30 – 45 ft^2)
Sto BTS Xtra	80731	17.2 kg bag (38 lb.)	Through the wall: 5.1 – 7.0 m^2 (55 – 75 ft^2) *As adhesive ribbons 13 x 13mm (½" x ½") notched trowel:* 8.4 – 12.5 m^2 (90 – 135 ft^2)	*As an adhesive with 16 x 16 mm (5/8" x 5/8") square notched trowel:* 7.9 – 9.3 m^2 (85 – 100 ft^2)
Sto BTS Silo	81727	27 kg bag (60 lb)	*Through the wall:* 6.0 – 8.4 m^2 (65 – 90 ft^2) *As adhesive ribbons 13 x 13mm (½" x ½") notched trowel:* 10.2 – 15.8 m^2 (110 – 170 ft^2)	*As an adhesive with 16 x 16mm (5/8" x 5/8") square notched trowel:* 3.5 – 5.1 m^2 (38 – 55 ft^2)

Sto Primer/Adhesive B	80101	23 kg bag (50 lb)	*Through the wall:* 5.1 – 6.5 m^2 (55 – 70 ft^2) *As adhesive ribbons 13 x 13mm (½" x ½") notched trowel:* 8.4 – 11.6 m^2 (90 – 125 ft^2)	*As an adhesive with 16 x 16mm (5/8" x 5/8") square notched trowel:* 2.8 – 4.2 m^2 (30 – 45 ft^2)
Sto Primer/Adhesive	80100	19 l pail (5 US gal.)	*Through the wall:* 8.8 – 11.1 m^2 (95 – 120 ft^2) *As adhesive ribbons 13 x 13 mm (½" x ½") notched* trowel: 18.6 – 23.2 m^2 (200 – 250 ft^2)	*As an adhesive with 16 x 16mm (5/8" x 5/8") square notched trowel:* 6.5 – 8.4 m^2 (70 – 90 ft^2)
Sto Flexyl	80235	19 l pail (5 US gal.)	7.4-10.2 m^2 (80-110 ft^2) per pail when mixed with required Portland cement	*Not recommended – rough substrates should be levelled*
Sto TurboStick	81181	10.4 kg (23 lb.) net material in 14.1 kg (31 lb.) gross weight cylinder	58 – 63 m^2 (625 – 675 ft^2) per cylinder Note: Reduce coverage by 15% for ProD insulation	*Not recommended – rough substrates should be levelled*

Meshes	**Product No.**	**Overlap**	**Weight/m^2 (yd^2)**	**Roll Size**
Sto Detail Mesh	80919	65 mm (2.5")	142 gm (4.2 oz)	45.7 m x 0.24 m = 11 m^2 (150' x 9.5" = 119 ft^2)
Sto Mesh 38"	80920	65 mm (2.5")	152 gm (4.5 oz)	45.7 m x 0.97 m = 44.1m^2 (150' x 38" = 475 ft^2)
Sto Mesh 48"	81920	65 mm (2.5")	152 gm (4.5 oz)	45.7 m x 1.23 m = 55.7 m^2 (150' x 48" = 600 ft^2)
Sto Mesh 6 oz.	80985	65 mm (2.5")	203 gm (6.0 oz)	45.7 m x 0.97 m = 44.1m^2 (150' x 38" = 475 ft^2)
Sto Intermediate Mesh 11oz.	80918	65 mm (2.5")	372 gm (11.0 oz)	22.9 m x 0.97 m = 22.0 m^2 (75' x 38" = 237 ft^2)
Sto Armor Mat 15 oz.	80921	Butt edges	507 gm (15.0 oz)	22.9 m x 0.97 m = 22.0 m^2 (75' x 38" = 237 ft^2)
Sto Armor Mat XX 20 oz.	80922	Butt edges	677 gm (20.0 oz)	22.9 m x 0.97 m = 22.0 m^2 (75' x 38" = 237 ft^2)

Base Coats	**Product No.**	**Package**	**EPS surface with Sto Mesh ***	**Skim Coat***
Sto BTS Plus	80727	21.3 kg bag (47 lb.)	7.4 – 11.6 m^2 (80 – 125 ft^2)	8.4 – 12.5 m^2 (90 – 135 ft^2)
Sto BTS Xtra	80731	17.2 kg bag (38 lb.)	7.4 – 11.6 m^2 (80 – 125 ft^2)	8.4 – 12.5 m^2 (90 – 135 ft^2) *at 3mm (1/8")* 3.7 – 5.9 m^2 (40 – 63 ft^2) *at 6.4mm (1/4")* 1.9 – 3.0 m^2

				(20 – 32 ft^2)
Sto BTS Silo	81727	27 kg bag (60 lb.)	9.3 – 14.9 m^2 (100 – 160 ft^2)	10.2 – 14.9 m^2 (110 – 160 ft^2)
Sto Primer/Adhesive B	80101	23 kg bag (50 lb.)	7 – 10.7 m^2 (75 – 115 ft^2)	8.4 – 12.5 m^2 (90 – 135 ft^2)
Sto Primer/Adhesive	80100	19 l pail (5 US gal.)	15.3 – 19.5 m^2 (165 – 210 ft^2) per pail when mixed with required Portland cement	16.7 – 24.2 m^2 (180 – 260 ft^2)
Sto Flexyl	80235	19 l pail (5 US gal.)	13.9 – 16.7 m^2 (150 – 180 ft^2) per pail when mixed with required Portland cement	13.9 – 14.9 m^2 (150 – 160 ft^2)
Sto RFP	80225	19 l pail (5 US gal.)	7.9 – 9.3 m^2 (85 – 100 ft^2)	7.9 – 9.3 m^2 (85 – 100 ft^2)
* Coverage will vary with application technique and surface conditions				

Finishes	**Product No.**	**Package**	**Smooth Primed Surface**	**Unprimed smooth surface ***
Stolit .75	80175	19 l pail (5 US gal.)	14.9 – 17.7 m^2 (160 – 190 ft^2)	Primer recommended
Stolit 1.0	80130		13.0 – 15.3 m^2 (140 – 165 ft^2)	Primer optional
Stolit 1.5	80131		11.1 – 13.5 m^2 (120 – 145 ft^2)	Primer optional
Stolit 2.0	80132		7.0 – 9.3 m^2 (75 – 100 ft^2)	Primer optional
Stolit 3.0	80135		5.1 – 6.5 m^2 (55 – 70 ft^2)	Primer optional
Stolit R1.5	80141		12.5 – 14.9 m^2 (135 – 160ft^2)	Primer recommended
Stolit R2.0	80142		7.0 – 9.3 m^2 (75 – 100 ft^2)	Primer recommended
Stolit R3.0	80143		5.1 – 7.0 m^2 (55 – 75 ft^2)	Primer recommended
Stolit Freeform	80156		3.7 – 12.1 m^2 (40 – 130 ft^2)	Primer optional
Stolit 1.0 Dark	82130		14.4 – 15.3 m^2 (155 – 165 ft^2)	Primer optional
Stolit 1.5 Dark	82131		11.1 – 13.5 m^2 (135 – 145 ft^2)	Primer optional
Stolit R1.5 Dark	82141		12.5 – 14.9 m^2 (135 – 160 ft^2)	Primer optional
Stolit Freeform Dark	82156		3.7 – 12.1 m^2 (40 – 130 ft^2)	Primer optional
Sto Essence DPR Finishes				
Sto Swirl	80307	19 l pail (5 US gal.)	11.1 – 13.0 m^2 (120 – 140 ft^2)	Primer recommended
Sto Medium Sand	80306		10.2 – 12.1 m^2 (110 – 130 ft^2)	Primer optional
Sto Essence Fine Sand	80310		13.0 – 14.9m^2 (140 – 160 ft^2)	Primer recommended
* coverage on unprimed surface will be reduced approximately 10%				

Coatings	Product No.	Package	Recoating*	Masonry*
StoSilco Lastic	80222	19 l pail (5 US gal.)	39 – 49 m^2 at 0.36 – 0.46 mm (445 – 585 ft^2 at 14 – 18 mils) *per coat*	21 – 28 m^2 at 0.36 – 0.46 mm (225-300 ft^2 at 14 – 1 8 mils) *per two coats*
StoLastic Sand	80211		49 – 48 m^2 at 0.3-0.36 mm (590 – 690 ft^2 at 12 – 14 mils) *per coat*	25 – 29 m^2 at 0.3 – 0.36 mm (295 – 345 ft^2 at 12 – 14 mils) *per two coats*
StoLastic Smooth	80212		49 – 48 m^2 at 0.3-0.36 mm (590 – 690 ft^2 at 12 – 14 mils) *per coat*	25 – 29 m^2 at 0.3 – 0.36 mm (295 – 345 ft^2 at 12 – 14 mils) *per two coats*
StoCoat Acryl	80201		85 – 115 m^2 at 0.13 – 0.18 mm (940 – 1270 ft^2 at 5 – 7 mils per coat) *per coats*	44 – 58 m^2 at 0.13 – 0.18 mm (470 – 635 ft^2 at 5 – 7 mils per coat) *per two coats*
StoCoat Acryl Plus	80648		68 – 88 m^2 at 0.2 – 0.25 mm (750 – 940 ft^2 at 8 – 10 mils per coat) *per coat*	34 – 44 m^2 at 0.2 – 0.25 mm (375 – 470 ft^2 at 8 – 10 mils per coat) *per two coats*
StoCoat Lotusan Low VOC	80217		85 – 115 m^2 at 0.13 – 0.18 mm (940 – 1270 ft^2 at 5 – 7 mils per coat) *per coat*	44 – 58 m^2 at 0.13 – 0.18 mm (470 – 635 ft^2 at 5 – 7 mils per coat) *per two coats*

* Coverage will vary depending upon application technique and surface condition, including smoothness and porosity

Sto Guard	Product No.	Package	Sheathing [1]	Masonry [2]
Sto Gold Coat	80265	19 l pail (5 US gal.)	**ASTM C 1177** 39 – 49 m^2 per coat (425 – 525 ft^2 per coat) **Plywood** 51 – 60 m^2 per coat (550 – 650 ft^2 per coat) **OSB** *Coverage for 2 coats:* 21 – 25.5 m^2 per coat (225 – 275 ft^2) ***Note**: Applied at 0.25 mm wet (10 wet mils) per coat. Two coats required for all sheathings.*	*Coverage for two coats:* 9.3 – 28 m^2 at 0.12 wet mm per coat (100 – 300 ft^2 at 10 – 30 wet mils per coat) ***Note**: Minimum two coats required*
StoGuard Vaporseal R	81294		**ASTM C 1177** 42 – 56 m^2 per coat (400 – 450 ft^2 per coat) **Plywood** 60 – 65 m^2 per coat (650 – 700 ft^2 per coat) **OSB** 49 – 60 m^2 per coat (525 – 650 ft^2 per	*Coverage for two coats:* 11.6 – 14 m^2 at 0.4 wet mm per coat (125 – 500 ft^2 at 16 wet mils per coat) ***Note**: Minimum two coats required.*

			coat) ***Note**: Applied at 0.4 mm wet (16 wet mils) per coat. Two coats required for all sheathings.*	
Sto Rapid Seal	80270	Cartridge or sausage	Cartridge: 2x4 rough opening: 8.8 m (29 ft.) 2x6 rough opening: 6.1 m (20 ft.) Sausage: 2x4 rough opening: 6.1 m (20 ft.) 2x6 rough opening: 4.3 m (14 ft.) • Applied at 0.3 wet mm (12 wet mils)	Rough surfaces will reduce coverage
Sto Rapid Fill	81295	Cartridge or sausage	Cartridge: 18 – 29 m (60 – 95 ft.) Sausage: 10 – 18 m (35 – 60 ft) • Applied at 0.5 – 0.8 wet mm (20 – 30 wet mils) 25 mm (1”) each side of joint	Rough surfaces will reduce coverage
StoGuard Tape 6”	80269	15.2 m roll x 152 mm wide (50’ roll x 6” wide)	Prime surfaces with StoGuard Primer or 3M Super 77 spray adhesive	
StoGuard Tape 9”	80271	15.2 m roll x 228 mm wide (50’ roll x 9” wide)	Prime surfaces with StoGuard Primer or 3M Super 77 spray adhesive	
StoGuard Transition Membrane	81272	50 m roll (164 ft. roll)	Bond StoGuard Transition Membrane to the substrate using a full bed of Sto Rapid Seal.	
1. Refer to Sto Tech Hotline No. 0614-BSc for coverage over different ASTM C 1177 Sheathings 2. CMU requires a minimum 2 coats or more depending on porosity and texture of the block.				

Note: Coverage rates are based upon actual field experience and are believed to be reliable. Please be advised that coverage rates can vary based upon the type of application methods employed and level of craftsmanship. Sto Canada hereby disclaims any and all liability for rates of coverage, which may differ from those published herein.