


 HP+™
Wall
System

HP+™ Wall System Technical Installation Manual


 BASF
We create chemistry

Issue Date: 9 September 2017 – Revision Date: 15 September 2020

CONTENTS:

General Information	1
Handling and Storage	3
Framing and Bracing Requirements	3
OSB/Neopor® Foam Plastic Insulating Sheathing	5
WALLTITE® Spray Polyurethane Foam Installation	9
Weather Resistive Barrier (WRB) Considerations	9
Vapour Barrier Considerations	9
Thermal Barrier Requirements	10
Damage Repair Recommendations	10
Appendix A	12

General Information:

Code Requirements:

This manual is intended to provide general information to the builder, designer, and end user. The following guidelines will help you properly install the HP+™ Wall System E, X and XR Series. Failure to install and finish this product in accordance with these guidelines and applicable building codes may lead to personal injury, affect system performance, and violate local building codes. These guidelines will not cover every installation as they are general in nature. Proper installation is defined as the most restrictive requirement specified by BASF Canada, DrJ Engineering Technical Evaluation Report (TER) 1506-02, 1410-01, 1506-01, or 1706-02, manufacturer's installation guidelines, local building code, engineer or architect of record, or other authority having jurisdiction. The builder and / or installer acknowledges that it is solely their obligation to comply with safety and building code requirements.

Neopor® Foam Plastic Insulating Sheathing (FPIS):

Neopor® handling instructions, and this installation manual must be followed throughout installation.

WALLTITE® medium density Spray Polyurethane Foam (SPF):

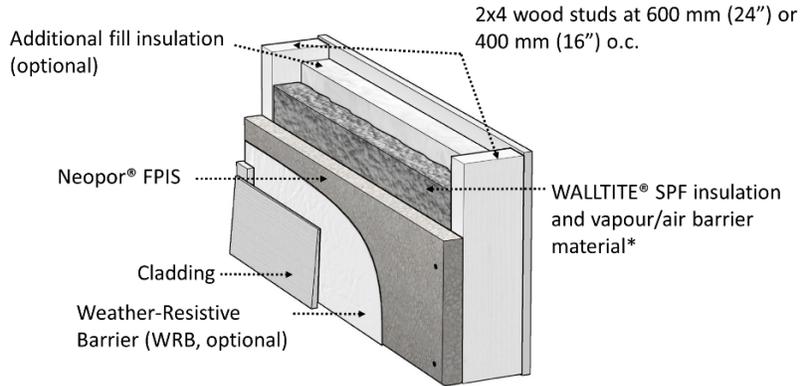
WALLTITE® Application Guidelines, and WALLTITE® Supplementary Guidelines for the HP+™ Wall System must be followed throughout installation by a Certified Installer that has completed the BASF Quality Assurance and Training Program (QATP), and is in good standing with the Caliber Quality Solutions Quality Assurance Program (CQSQAP).

TIP! DrJ Engineering Technical Evaluation Reports (TERs) may be found at www.drjcertification.org/code-compliance. WALLTITE® and Neopor® documents and information may be found at www.walltite.basf.ca and www.neopor-insulation.com respectively.

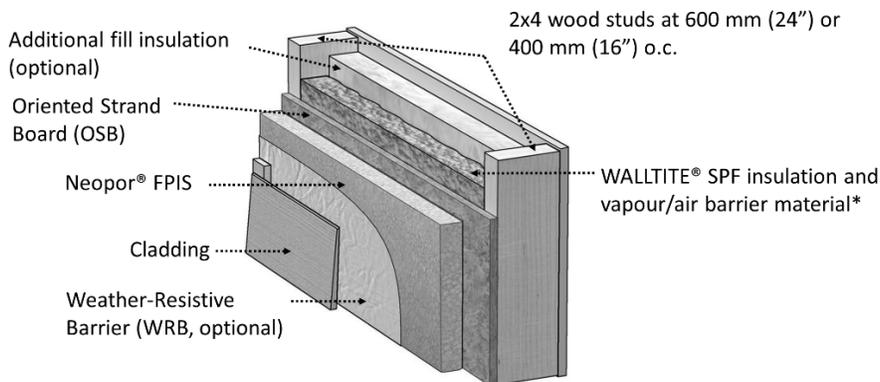
What is the HP+™ Wall System?

The HP+™ Wall System is a durable, structural exterior wall assembly that meets or exceeds codes while using less wood than traditional construction, resulting in exceptional energy performance and cost efficiency.

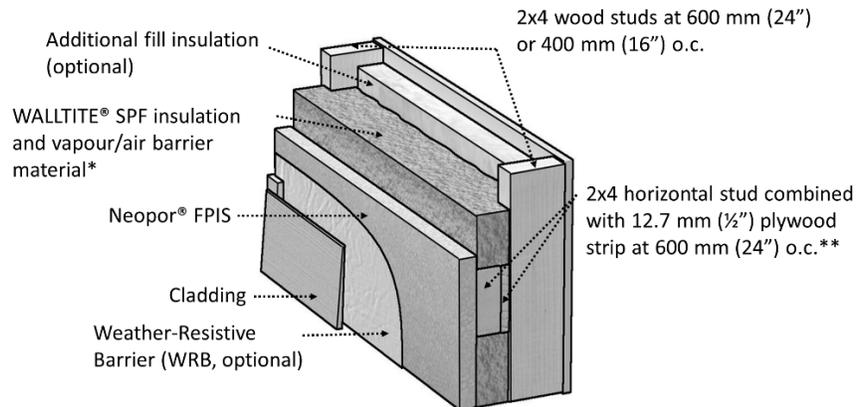
The HP+™ Wall System **E Series** features the following components:



The HP+™ Wall System **X Series** features the following components:



The HP+™ Wall System **XR Series** features the following components:



* WALLTITE® may fulfill the function of a vapour barrier depending on installed thickness, location in the wall assembly, and wall design. Where additional fill insulation is used, have the wall assembly verified by a design professional.

** For other HP+™ Wall XR Series wood and metal girt options, refer to the Field Assembly Guide and TER 1506-01 or 1706-02.

Handling and Storage:

Neopor® FPIS:

- Storage and handling to follow Neopor® handling instructions.
- Must be protected at all times from reflected sunlight, prolonged solar or moisture exposure.
- Must be protected during storage and transportation with corrugated cardboard and/ or white opaque film only. Corners and edges must be protected to limit damage to sheathing.
- Must be lifted (e.g. using a fork-lift) or carried off the truck not “dumped” off the transport truck.

TIP! Neopor® handling instructions available at www.Neopor-insulation.com.

WALLTITE® medium density SPF:

- Component storage to follow WALLTITE® Technical Product Sheet.
- Shelf life of WALLTITE® is approximately 6 months when stored in original, unopened containers at 15-25°C (59-77 °F).
- Components must be stored in a covered, secure location and never in direct sunlight.

Premanufactured HP+^{MD} panels:

- To minimize damage to Neopor® sheathing and discoloration of WALLTITE® due to UV exposure, stack panels Neopor® to Neopor® and stud to stud.
- Allow time for cooling of panels prior to stacking.
- Discoloration due to UV exposure is cosmetic only and does not affect structural integrity or insulation values.
- Protect finished panels from weather and UV exposure per Neopor® handling instructions.
- During handling, avoid dragging and dropping panels to prevent panel damage.

Framing and Bracing Requirements:

Confirm the installation crew is familiar with the provisions of the construction documents, this installation manual, site specific conditions and issues, and jobsite lifting and fall protection requirements in accordance with provincial regulations.

Wood Framing Components:

- The HP+™ Walls are constructed with 2x4 wood studs – minimum SPF grade. Each stud is fastened to top and bottom plates with minimum three 3.3 mm (0.131 in) x 83 mm (3.25 in) nails.
- The HP+™ Wall XR Series uses 2x6 top and bottom plates; the E Series and X Series use 2x4 top and bottom plates.
- In the HP+™ Wall X Series, Oriented Strand Board (OSB) sheathing of 6 mm (¼ in) is installed and fastened directly to the studs.
- In the HP+™ Wall XR Series, 2x4 finished timber girts are installed horizontally at maximum 600 mm (24 in) o.c. with 12.7 mm (½ in) plywood strips. The girts are fastened to the studs using two 3.3 mm (0.131 in) x 83 mm (3.25 in) nails at each stud intersection.
Note: for other HP+™ Wall XR Series wood and metal girt options, refer to the TER 1506-01 or 1706-02 Sections 4.1.1.3 to 4.1.1.7.

Advanced Framing Considerations:

Advanced Framing (also known as Optimum Value Engineering) may be incorporated with this wall system by the Design Professional. Contact your Design Professional to coordinate which advanced framing options, if any, were designed into the wall system.

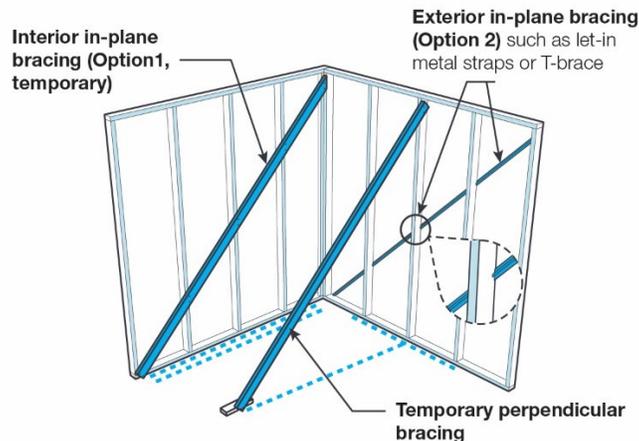
Additional studs or blocking may be required by the cladding manufacturer, or for window and door frame bearing.

Temporary perpendicular bracing:

Means and methods for construction of temporary bracing perpendicular to exterior walls are the responsibility of the building contractor. For guidance in temporary perpendicular bracing, see the Structural Building Components Association's (SBCA) *Guide for Handling, Installing & Temporary Bracing of Wall Panels*.

Pre-WALLTITE® in-plane bracing (Options 1 and 2):

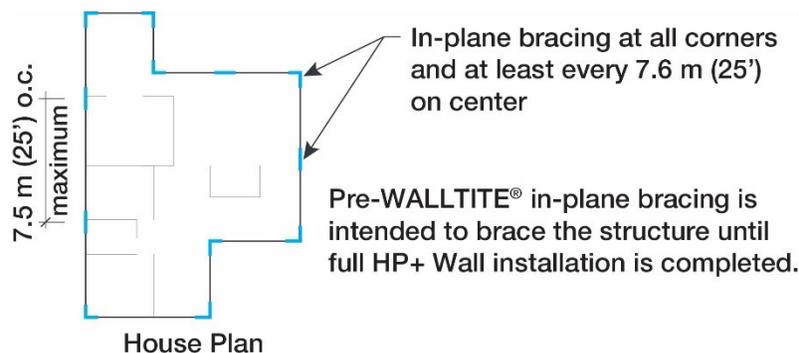
In-plane bracing, as described below, must remain in place until the complete HP+™ Wall E or XR Series—system (or WALLTITE® closed cell SPF) is installed.



TIP! Pre-WALLTITE® in-plane bracing must remain installed in the HP+™ Wall E Series (Option 1 or 2) and XR Series (Option 1) until WALLTITE® is installed to complete the structural system. The Neopor® sheathing alone is not an approved bracing method.

Panels built off-site may or may not be fully braced. Verify panel installation requirements with Design Professional of record or panel manufacturer.

Pre-WALLTITE® in-plane bracing can follow any approved wall bracing method. The following description highlights two common methods that cover most installations. The installer may use either of these options to meet bracing needs.



Interior in-plane bracing (Option 1, temporary):

- Diagonal bracing on the interior face of the framed wall must be spaced a maximum of 7.5 m (25 ft) o.c. along the length of the wall line and at each corner.
- Face nail each brace to the top and bottom plates and each backing stud using two nails to obtain a minimum 25 mm (1 in) nail penetration into the framing.

Exterior in-plane bracing (Option 2):

- Let-in diagonal bracing utilized on the exterior face of the framing must be spaced a maximum of 7.5 m (25 ft) o.c. along the length of the wall line and at each corner.
- Ensure bracing is set at a 45° angle along the plane of the wall and extends from the top of the wall, to the bottom plate along the floor line.
- Fasten the diagonal bracing to the top and bottom plates and to each stud using two nails to obtain a minimum 25 mm (1 in) nail penetration into the framing. Where proprietary bracing is used, consult the installation instructions of the manufacturer.

Permanent Bracing Requirements:

Bracing requirements must follow the Design Professional drawing details provided in the plan set and the installation details provided in Section 6 of the TER to which it references.

Uplift Strapping:

Install any necessary mechanical strapping directly to framing. Any metal straps, ties, or other connectors designed to resist uplift or shear loads must be installed prior to Neopor® installation. The requirement for mechanical uplift connections must be determined by the designer of record, local building codes, or authority having jurisdiction.

OSB/Neopor® Foam Plastic Insulating Sheathing:

All items below apply regardless of wall construction method (e.g. tilt up, site built, or panelized).

TIP! Sheathing must be installed with the long dimension of the panels parallel to the stud or girt behind. For the HP+™ Wall E Series and X Series, all panel edges must be supported by framing or blocking.

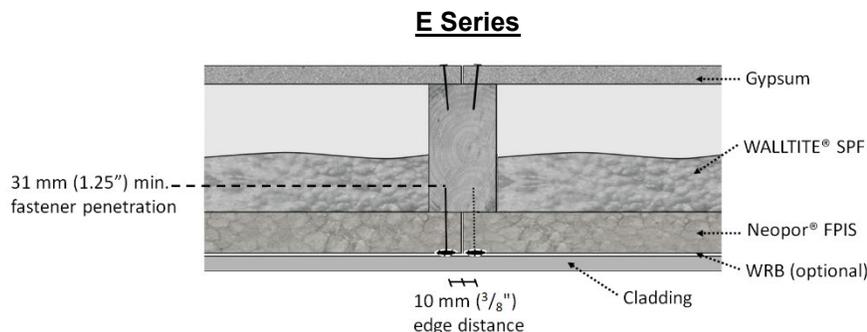
Neopor® sheathing can be installed with or without wood furring strips on the exterior side.

Note: where furring strips are installed, the minimum dimensions of wood strips are 19 mm x 63 mm (1 in x 3 in), and 19 mm x 89 mm (1 in x 4 in) for Neopor® thickness of 50 mm (2 in) or greater.

Fastening requirements:

TIP! Only fastening methods covered in the TERs and this Installation Manual are allowed with the HP+™ Wall System. Refer to TERs Sections 6.3 and 6.4, and the Construction Documents to determine the minimum fastening requirements for your project. In event of conflict between the installation instructions in this document and the TERs, the more stringent shall govern.

- Fasteners must be of sufficient length to penetrate the framing with the minimum penetrations provided in **Table 1** and **Table 2** of this document.
- Fasteners must be installed with plastic caps, where in direct contact with Neopor® sheathing.
- Fastener spacing should not exceed the spacing provided in **Table 1** and **Table 2**. Sheathing attachment patterns are illustrated in Appendix A.
- Neopor® panel edges to be fastened per details described in the graphics below:



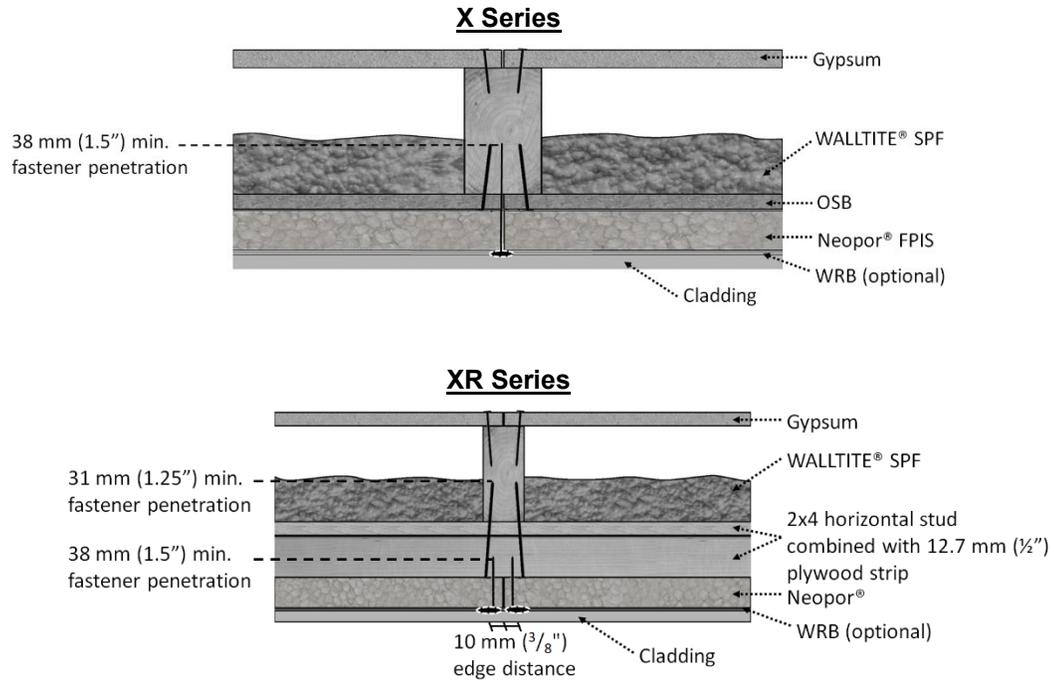


Table 1: Sheathing fastening requirements – without furring strips

E Series¹	
Fasteners (minimum)³	3.3 mm (0.131 in) x 60 mm (2-3/8 in) nail
Minimum penetration into framing	31 mm (1.25 in)
Spacing	150 mm (6 in) o.c. at panel edges and 200 mm (8 in) o.c. in the field
X Series²	
OSB sheathing	
Fasteners (minimum)	63 mm (2.5 in) common or spiral nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	150 mm (6 in) o.c. at panel edges and 200 mm (8 in) o.c. in the field
Neopor® sheathing	
Fasteners (minimum)³	3.3 mm (0.131 in) x 89 mm (3.5 in) nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	300 mm (12 in) o.c. at panel edges and 300 mm (12 in) o.c. in the field
XR Series^{1,4}	
Fasteners (minimum)	3.3 mm (0.131 in) x 89 mm (3.5 in) nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	150 mm (6 in) o.c. at panel edges and 200 mm (8 in) o.c. in the field (along the girts)

¹ Fastening details are for the Neopor® sheathing.
² Ensure the OSB is installed and fastened in direct contact with framing, before installing the Neopor® sheathing.
³ Use longer nails as required, to ensure minimum penetration into framing.
⁴ Refer to the TER Section 6.3.1 for the minimum fasteners required with metal girts (i.e. Z-bar or Hat Channel).

Table 2: Sheathing fastening requirements – **with** furring strips

E Series¹	
Fasteners (minimum)³	3.3 mm (0.131 in) x 60 mm (2-3/8 in) nail
Minimum penetration into framing	31 mm (1.25 in)
Spacing	<ul style="list-style-type: none"> - Fasten the corners of each Neopor® panel. - Use furring strips to fasten Neopor® sheathing to the studs. Space fasteners along furring strips at 200 mm (8 in) o.c. in the field, and 150 mm (6 in) o.c. at the edges. - Use additional fasteners to ensure the Neopor® sheathing is fastened at 150 mm (6 in) o.c. at the top and bottom plates (i.e. between furring strips).
X Series²	
OSB sheathing	
Fasteners (minimum)	63 mm (2.5 in) common or spiral nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	<ul style="list-style-type: none"> - Fasten the OSB sheathing along panel perimeter at 150 mm (6 in) o.c. and 200 mm (8 in) o.c. in the field.
Neopor® sheathing	
Fasteners (minimum)³	3.3 mm (0.131 in) x 89 mm (3.5 in) nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	<ul style="list-style-type: none"> - Fasten the corners of each Neopor® panel. - Use furring strips to fasten Neopor® sheathing to the studs. Space fasteners along furring strips at 300 mm (12 in).
XR Series^{1,4}	
Fasteners (minimum)³	3.3 mm (0.131 in) x 89 mm (3.5 in) nail
Minimum penetration into framing	38 mm (1.5 in)
Spacing	<ul style="list-style-type: none"> - Fasten the corners of each Neopor® panel. - Use furring strips to fasten field of Neopor® sheathing to the horizontal girts. - Space fasteners along panel perimeter at 150 mm (6 in). - Use additional fasteners to ensure the Neopor® sheathing is fastened at 200 mm (8 in) o.c. along girts (i.e. between the furring strips).
<p>¹ Fastening details are for the Neopor® sheathing.</p> <p>² Ensure the OSB is installed and fastened in direct contact with framing, before installing the Neopor® sheathing.</p> <p>³ Use longer nails as required, to ensure minimum penetration into framing.</p> <p>⁴ Refer to the TER Section 6.3.1 for the minimum fasteners required with metal girts (i.e. Z-bar or Hat Channel).</p>	

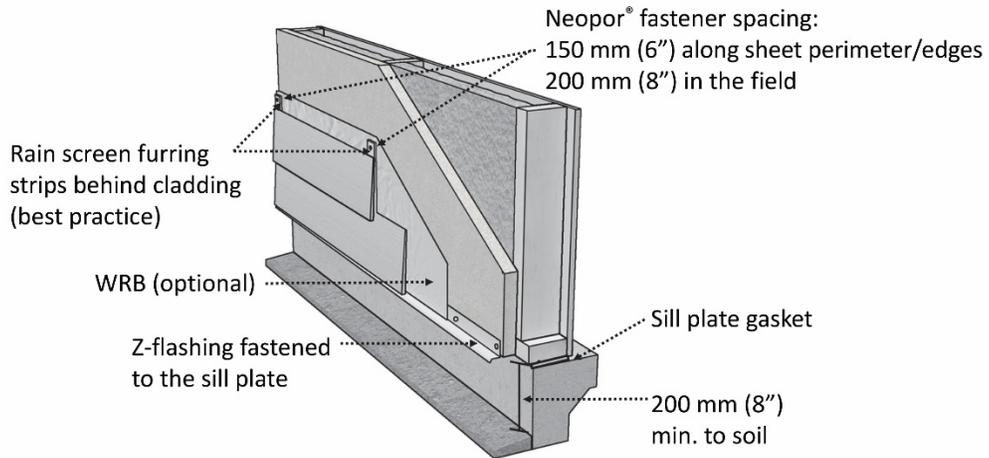
TIP! Maintain a tight connection to the framing to prevent spray foam from expanding in any space left between the OSB or the Neopor® sheathing and the framing, resulting in an uneven surface for the cladding.

Coordinate cladding attachment with manufacturer's requirements for installation over foam sheathing.

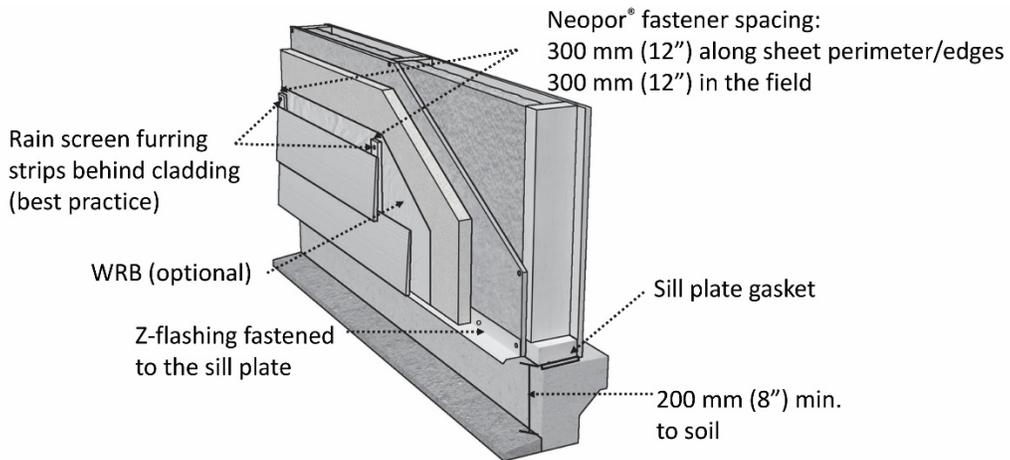
Clearance and flashing requirements:

- Maintain a minimum 200 mm (8 in) clearance between ground and moisture-sensitive cladding.
- The use of Z-flashing is recommended to be installed after the installation of Neopor® sheathing, or between the OSB and Neopor® in the HP+™ Wall X Series.

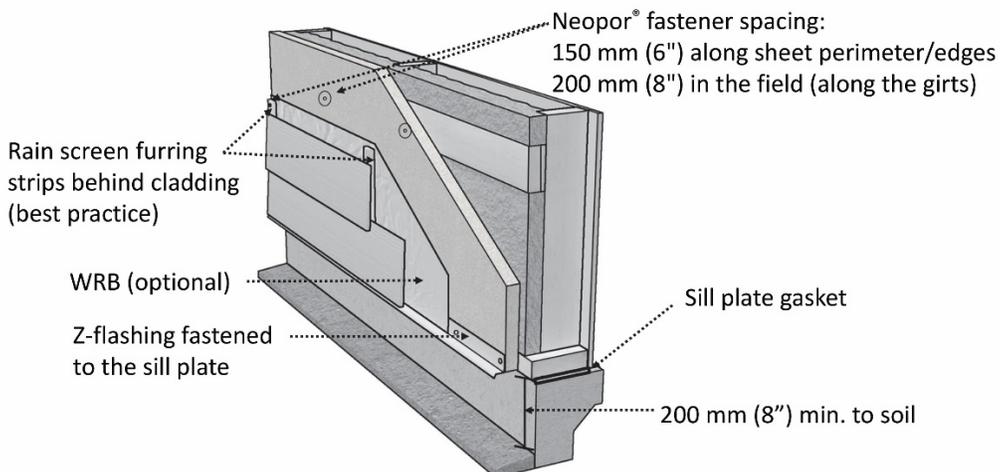
E Series



X Series



XR Series



WALLTITE® Spray Polyurethane Foam Installation:

For site-built projects, installation of WALLTITE® SPF must only start after all exterior walls on all floors have been framed and braced, and all exterior Neopor® sheathing has been fastened.

Only a Certified Installer that has completed the BASF Quality Assurance and Training Program (QATP), and is in good standing with the Caliber Quality Solutions Quality Assurance Program (CQSQAP) can install WALLTITE®.

Once all roof and floor framing, and WALLTITE® is fully installed, temporary perpendicular bracing may be removed (see Pre-WALLTITE® in-plane bracing).

During WALLTITE® installation, in-plane interior bracing may only be removed in a maximum of 7.5 m (25 ft) linear sections once all roof, floor diaphragms, and interior walls are framed. Each 7.5 m (25 ft) section must receive full spray installation before the next 7.5 m (25 ft) section of temporary interior bracing is removed.

WALLTITE® Application Guidelines, and WALLTITE® Supplementary Guidelines for the HP+™ Wall System must be followed throughout installation.

- WALLTITE® sets almost immediately. Ensure wall is square and true prior to spray foam installation.
- Ensure the interior face of the Neopor® sheathing is unfaced with any plastic, foil, or other film before WALLTITE® installation.
- First pass may not exceed 12.7 mm to 19 mm (½ in to ¾ in) on Neopor® substrate. Subsequent passes must allow minimum 10-minute dwell time. Dwell time can be adjusted based on QATP requirements.
- All personnel entering the work area must wear appropriate personal protective equipment.
- Safety signage must be posted at all entrances.
- A Daily Work Record Sheet (DWR) is required for each project. A copy of the DWR must be retained by the contractor per the requirements of the QATP.

For Premanufactured HP+ Panels:

- Spray foam installation area must be isolated and ventilated in accordance with the requirements of standard CAN/ULC-S705.2.

Weather-Resistive Barrier (WRB) Considerations:

A weather-resistive barrier is required outside the exterior surface of the Neopor® sheathing, unless the Neopor® sheathing has shiplap, tongue and groove, or sealed joints. The WRB must be installed with penetration and joint flashing in accordance with local building code requirements.

Best practice: use a rainscreen assembly behind cladding to ensure proper drainage and promote drying of the wall assembly to the outside.

Vapour Barrier Considerations:

WALLTITE® can fulfill the function of a vapour barrier depending on the installed thickness and the wall design. Please see WALLTITE® Technical Product Sheet for water vapour permeance data.

Where relative humidity exceeds recommended levels, installation of additional vapour barriers should be undertaken under the guidance of a design professional.

Thermal Barrier Requirements:

WALLTITE® and Neopor® must be protected from the interior of the building by a code recognized finish or thermal barrier.

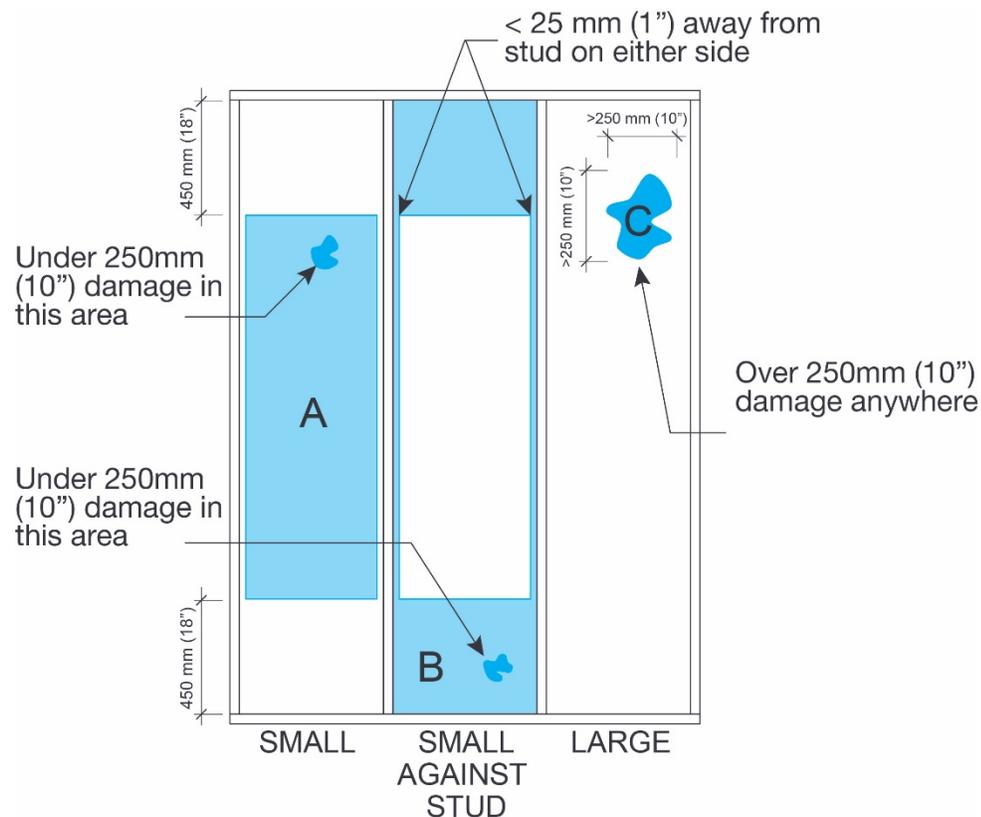
There must be a minimum 76 mm (3 in) clearance between WALLTITE® and all combustion appliances, heat emitting devices and components such as chimneys, heater vents, steam pipes or as required by the appliance manufacturer, whichever is more stringent.¹

There must be a minimum 76 mm (3 in) clearance between WALLTITE® and all recessed lighting fixtures.¹

Damage Repair Recommendations:

Definitions of repair size:

- **Small damage repair: an area smaller than a 250 mm x 250 mm (10 in x 10 in) square, located more than 450 mm (18 in) from the top and bottom plates, and more than 25 mm (1 in) away from the studs (Section A).** An example that fits into this definition is moving a side-wall vent.
- **Small damage repair against stud, girt or plate: an area smaller than 250 mm x 250 mm (10 in x 10 in) located within 450 mm (18 in) from the top and bottom plates, and less than 25 mm (1 in) away from the studs (Section B).**
- **Large damage repair: an area outside of the limitations of small damage repair and small against stud damage repair (Section C).**



1. As specified in standard CAN/ULC-S705.2.

TIP! One-component and two-component sealant foams used for WALLTITE® repair must be polyurethane based.

Sealants and caulking used to repair WALLTITE® and Neopor® foam must be polyurethane based. BASF manufactures MasterSeal® NP 1 one-component elastomeric polyurethane sealant, which complies with these requirements.

Neopor® or Neopor®/OSB sheathing damage only:

- **Small damage repair** – Damaged material can be removed and/ or replaced with the same size plug of Neopor® or Neopor®/OSB laminated material. The repair piece must be adhered, taped, or mechanically fastened to avoid any change in sheathing plane. Do not tape the interior face of the sheathing which would prevent full adherence of the WALLTITE® spray foam.
- **Small damage repair against stud, girt or plate** – Damaged material can be removed and / or replaced with the same size plug of Neopor® or Neopor®/OSB laminated material using the same method as in small damage repair.
- **Large damage repair** – Requires full sheet replacement.

WALLTITE® damage only:

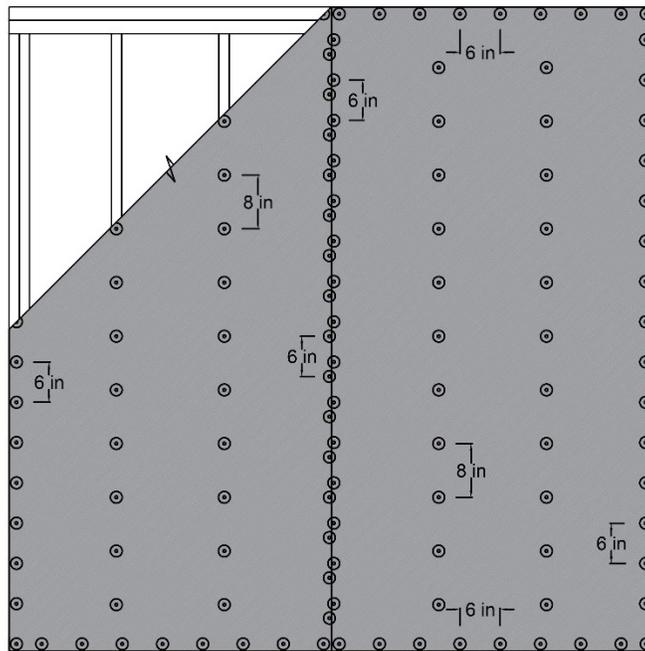
- **Small damage repair** – Repair with a single-component spray or canister polyurethane sealant foam.
- **Small damage repair against stud, girt or plate** – Repair with a two-component closed cell spray foam material.
- **Large damage repair** – Repair with WALLTITE® closed cell spray foam.

HP+™ Wall System damage:

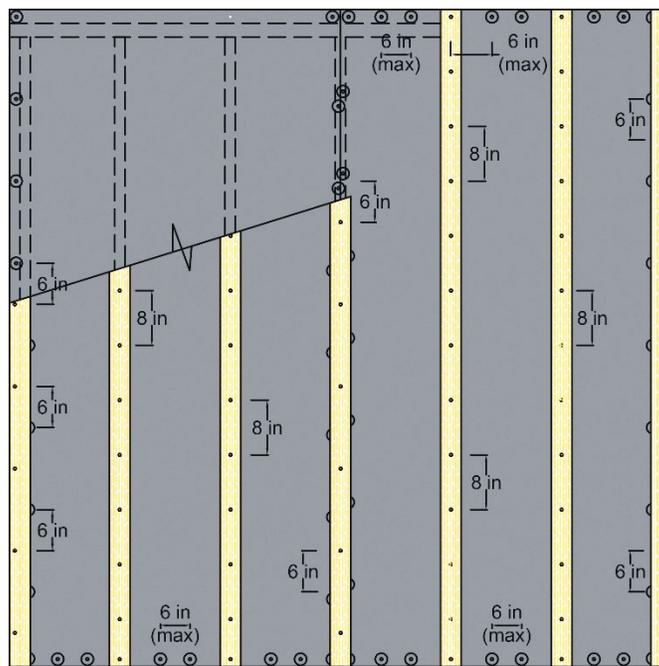
- **Small damage repair** – Repair Neopor® or Neopor®/OSB laminate sheathing with same size plug of same Neopor® or Neopor®/OSB material. The repair piece must be adhered, taped, or mechanically fastened to avoid any change in sheathing plane. Seal edges of repair piece with single-component spray OR canister polyurethane foam OR sealant foam. Fill cavity insulation void with an equivalent R-value substitute.
- **Small damage repair against stud, girt or plate** – Repair with a two-component closed cell spray foam material.
- **Large damage repair** – The entire framing bay(s) damaged must be fully repaired following the original Construction Document requirements, the TER and this Installation Manual.

Appendix A:

**Neopor® Attachment Pattern
HP+™ Wall E Series (without furring strips)**

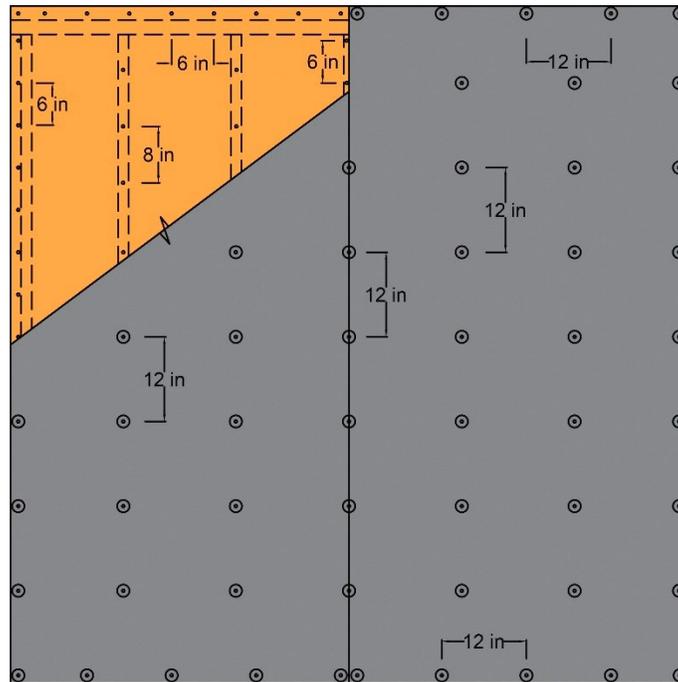


**Neopor® Attachment Pattern
HP+™ Wall E Series (with furring strips)**

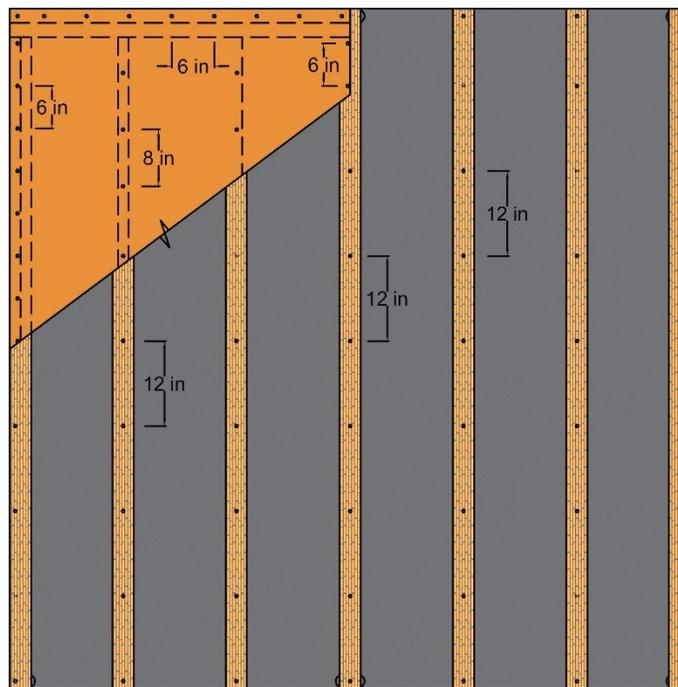


-  Neopor FPIS
-  furring strip
-  nail with plastic cap

**Neopor® and OSB Attachment Pattern
HP+™ Wall X Series (without furring strips)**



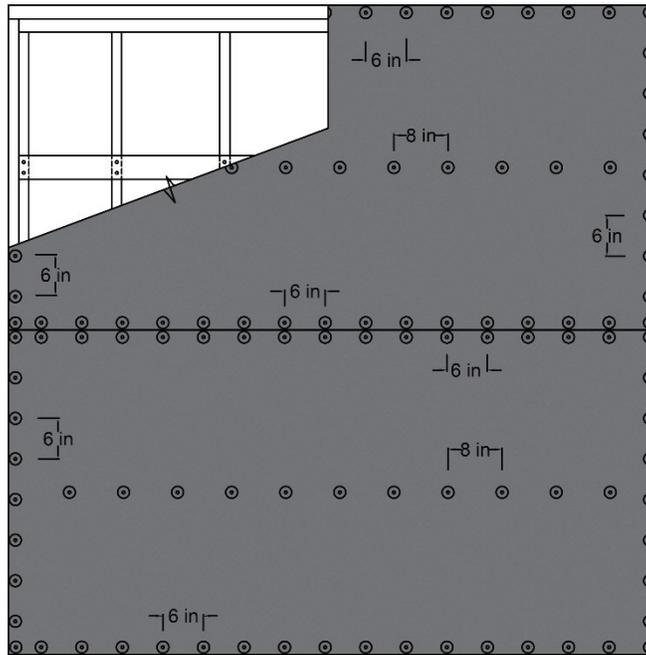
**Neopor® and OSB Attachment Pattern
HP+™ Wall X Series (with furring strips)**



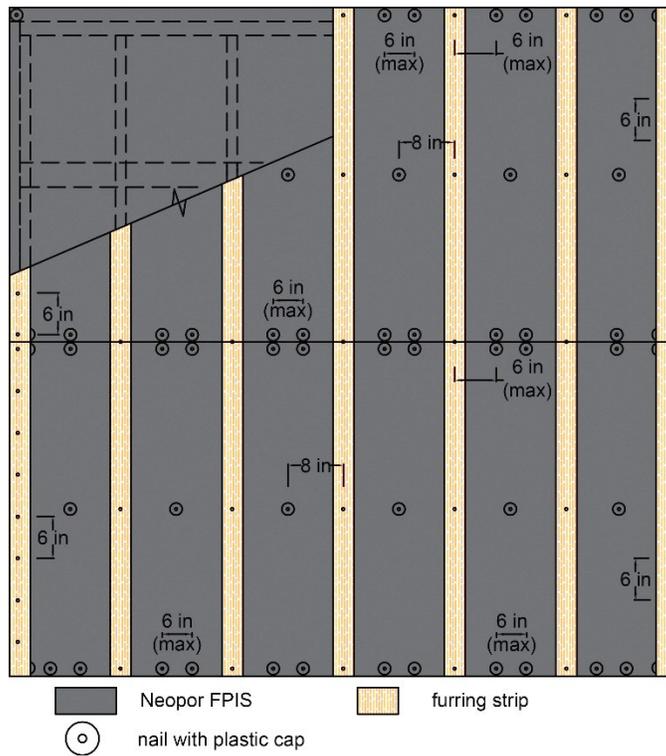
-
 Neopor FPIS
-
 OSB sheathing
-
 furring strip
-
 nail with plastic cap

Neopor® Attachment Pattern

HP+™ Wall XR Series (without furring strips)



**Neopor® Attachment Pattern
HP+™ Wall XR Series (with furring strips)**



MasterSeal is a registered trademark of BASF Group, WALLTITE is a registered trademark of BASF Canada, HP+ Wall System is a trademark of BASF (patents pending). Neopor is a registered trademark of BASF SE.

©2017 BASF Canada – 9 September 2017