

OUTSULATION[®] SYSTEM FOR PRE-ENGINEERED METAL BUILDINGS



DS858

**A Mechanically Fastened Exterior Wall Insulation and Finish System
That Incorporates Continuous Insulation**

Outsulation System For Pre-Engineered Metal Buildings Application Instructions

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I. General Installation Requirements**A. Project Conditions****1. Storage**

a. Materials shall be stored at the job site, and at all times, in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be as follows:

1) DPR, PMR™, HDP™, Weatherlastic®, and E Finishes™, Color Prime™, Primus®, Genesis® and NCB™: 40 °F (4 °C).

2) For all other products, refer to specific product data sheets.

b. Maximum storage temperature shall not exceed 100 °F (38° C). **NOTE: Minimize exposure of materials to temperatures over 90 °F (32 °C). Finishes exposed to temperatures over 110 °F (43 °C) for even short periods may exhibit skinning, increased viscosity and should be inspected prior to use.**

c. Protect all products from inclement weather and direct sunlight.

2. Application

a. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.

1) At the time of Dryvit product application, the air and wall surface temperatures shall be from 40 °F (4 °C) minimum to 100 °F (38° C) maximum for the following products:

a) DPR, PMR, HDP, Weatherlastic and E Finishes, Color Prime, Primus, Genesis and NCB: 40 °F (4 °C).

b) For all other products, refer to specific product data sheets.

B. Inspection of Pre-Engineered Metal Building Panels

1. The steel siding must be securely fastened per contract documents.

2. There shall be no planar irregularities greater than 1/4 in (6.4 mm) within any 4 ft (1.2 m) radius.

3. The metal siding profile shall provide a minimum 50% raised rib area to provide adequate support for expanded polystyrene (EPS). All vertical EPS edges shall be supported on a raised rib.

NOTE: Substrates not meeting these requirements or otherwise questionable may require a leveling sheathing installed over pre-engineered metal building siding prior to EIFS installation.

C. Flashing at System Terminations**1. General**

a. Ensure that flashing is installed in accordance with applicable code requirements and the contract documents. As a minimum, opening preparation is required as shown in the Dryvit Outsulation System Installation Details, [DS107](#).

2. Transition at Roof Lines

a. Ensure the roof has positive drainage, i.e. all runoff shall be directed to the exterior and away from the structure.

b. Roof flashing shall be installed in accordance with industry guidelines, manufacturer's instructions and contract documents.

c. Runoff diverters (i.e. kickouts, crickets and saddles) must be installed where required. Particular attention must be paid to the eaves/chimney intersections, sloped roof/wall intersections, scuppers and parapet caps. Refer to the Dryvit Outsulation System Installation Details, [DS107](#) and contract documents.

d. Hold system a minimum of 8 in (203 mm) above flat roofs; 2 in (51 mm) above sloped roofs.

3. Openings

a. Heads, jambs and sills of all openings shall be prepared with Dryvit AquaFlash® System, [DS196](#); Backstop® Flash & Fill, [DS874](#), or other code approved flashing material selected by the design professional prior to window/door, mechanical equipment, or other component installation. Refer to the Dryvit Outsulation Installation Details, [DS107](#).

NOTE: Sill piece shall extend to the inside face of wall and continue a minimum of 4 in (102 mm) up at the jambs.

- b. Continuous flashing at heads of openings as indicated in contract documents.
NOTE: For windows or doors that do not have integral flashing, a field-applied flashing must be installed as required (by others). Refer to the Dryvit Outsulation System Installation Details, [DS107](#).
- c. Individual windows that are ganged to make multiple units require the heads to be continuously flashed and the joints between the units to be fully sealed.
- 4. Decks and Patios
 - a. Wood decks shall be properly flashed prior to system application. See the Dryvit Outsulation System Installation Details, [DS107](#) for general information and guidance.
 - b. Verify that the system terminates above poured decks, patios, landings, etc. that are properly sloped and waterproofed to direct water away from the walls.
- 5. Utilities
 - a. Provisions must be made to ensure that the system terminates properly at lighting fixtures, electrical outlets, hose bibs, dryer vents, etc. Refer to the Dryvit Outsulation System Installation Details, [DS107](#).
- 6. Grade Level Terminations
 - a. Hold system a minimum of 8 in (203 mm) above finished grade.
- D. Sealants
 - 1. Dryvit materials shall be completely dry prior to installation of sealant materials (typically 48 - 72 hours). Humid or cool conditions may require longer drying times.
 - 2. Sealants and sealant primers are manufactured and supplied by others. Refer to [DS153](#) for a list of sealants that have been tested by the sealant manufacturer's and found to be compatible with Dryvit products.

Notify the general contractor and/or architect and/or owner of all discrepancies. Do not proceed until all unsatisfactory conditions have been corrected.

II. Materials Required for Mechanically Attaching the Outsulation System over Pre-Engineered Metal Buildings

- A. Materials Supplied by Dryvit Systems, Inc.
 - 1. AquaFlash and AquaFlash Mesh
 - 2. Backstop Flash & Fill
 - 3. Genesis®, Genesis® DM
 - 4. Standard Mesh, Standard Plus Mesh, Intermediate Mesh, Panzer® 15, Panzer® 20, Corner Mesh™, and Detail Mesh®
 - a. It shall be colored blue for product identification bearing the Dryvit logo.
 - 5. Dryvit Finishes
 - 6. Dryvit Coatings and Primers

NOTE: Materials listed above are also listed in the Outsulation System For Pre-Engineered Metal Building Specification, [DS857](#). Typically the project specification will identify the materials necessary to complete application.

- B. Additional Materials Supplied by Others
 - 1. Portland Cement: Type I or II
 - 2. Clean Potable Water
 - 3. Expanded Polystyrene Insulation Board meeting [DS131](#)
 - 4. Mechanical Fasteners (washers and screws)
 - 5. Flashing
 - 6. Sealants

III. Mixing Instructions

- A. General
 - 1. No additives such as sand, aggregates, rapid binders, anti-freeze, accelerators, etc. shall be added to any Dryvit materials under any circumstances. **Such additives will adversely affect the performance of the material and void all warranties.**
- B. Base Coat
 - 1. Genesis
 - a. Open the bucket with a utility knife or lid-off.

- b. Due to shipping and storage, there may be some separation of materials. Prior to splitting the material and adding Portland cement, mix the material thoroughly. Use a “Twister” paddle or equivalent mixing blade powered by a 1/2 in (12.7 mm) drill, at 500 - 1200 rpm only. **NOTE: A minimum 7 amp drill works best for Portland cement based materials. CAUTION: Do not over-mix or use other types of mixing blades as air entrapment and product damage may occur and result in workability and performance problems.**
- c. Pour 1/2 of the freshly mixed material [approximately 30 lbs (13.5 kg)] into a clean plastic container.
- d. Add 1/3 of a bag [approximately 30 lbs (13.5 kg)] of fresh, lump free Type I or II Portland cement. Either gray or white cement is acceptable. Add cement slowly and mix thoroughly. **Do not add large quantities of cement at one time.**
- e. Clean potable water may be added to the mixture to adjust the workability.
 - 1) Add 1 qt (950 ml) of water prior to adding Portland cement. Additional water may be added to adjust workability.
 - 2) Mix the Genesis material with Portland cement thoroughly; then wait five - ten (5 – 10) minutes, then break the initial set. Retempering with a small amount of water is permissible provided the mixture has not set. The mixture has a pot life similar to other Portland cement plaster material. Mix only as much material as can be conveniently used during a work period.

2. Genesis DM

a. Pail Mixing

- 1) One bag of Genesis DM will produce approximately 5 gal (19 L) of Genesis DM mixture. To a clean 5 gal (19 L) pail, add 6 - 7 qt (5.7 - 6.6 L) of clean potable water.
- 2) Add the Genesis DM slowly while constantly mixing with a “Twister” paddle or equivalent mixing blade, powered by a 1/2 in (12.7 mm) drill, at 500 - 1200 rpm. **NOTE: A minimum 7 amp drill works best for Portland cement based materials.**
- 3) Thoroughly mix until uniformly wetted, adjusting consistency with a small amount of water or Genesis DM material.
- 4) Allow the mixture to set for five - ten (5 - 10) minutes and mix again to break the initial set. Retemper, adding a small amount of water if necessary. Material must be free of lumps before using.

b. Mortar Mixer

- 1) Add 6 - 7 qt (5.7 - 6.6 L) of clean potable water for each 50 lb (22.7 kg) bag of Genesis DM into a clean mortar mixer.
- 2) Add the Genesis DM while the mixer is running. Mix three to five (3 – 5) minutes, shut the mixer off for five - ten (5 - 10) minutes, then run mixer for another two to three (2 – 3) minutes to break the initial set adding a small amount of water if necessary to adjust workability. The pot life is one to one and one half (1 - 1 1/2) hours depending on weather.

D. Primers

- 1. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

E. Finish

- 1. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

G. Coatings and Sealers

- 1. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

IV. Rough Opening Preparation

- 1. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

V. Accessories

A. Mechanical Fasteners for Securing Insulation Board

- 1. Washer: A 2 in (51 mm) diameter polypropylene plastic washer specifically designed for use with Exterior Insulation and Finish Systems. The following washer is acceptable:
 - a. Wind-lock Wind-Devil 2 plates
- 2. Fasteners
 - a. Light Gauge Steel Framing (16 - 26 ga)
 - 1) Shall be minimum No. 6 bugle head corrosion resistant screws.
 - 2) The screws shall be of sufficient length to penetrate the steel substrate a minimum of 3/8 in (9.5 mm).

VI. Installation of Insulation Board

A. Inspection of Insulation Board

1. Insulation board shipped in a clear polyethylene bag bearing the Dryvit name. The lot number of the insulation shall be visible on the outside of the bag. Insulation board shall be obtained from Dryvit Systems, Inc. or its authorized distributors, and made exclusively by manufacturers licensed by Dryvit Systems, Inc.
2. One edge of each board shall bear the words Dryvit, the plant identification number of the block molder, the appropriate model code report number, and the name of the third party quality control agency with corresponding number. In addition, one board in each bag shall bear the same markings on each face.
3. The insulation board shall measure maximum 2 ft (.61 m) by 4 ft (1.2 m).
4. Insulation board meets the following tolerances:
 - a. Length: Plus or minus 1/16 in (1.6 mm)
 - b. Width: Plus or minus 1/16 in (1.6 mm)
 - c. Thickness: Plus or minus 1/16 in (1.6 mm). Minimum thickness shall be 1 in (25 mm).
 - d. Squareness: Shall not deviate from square by more than 1/32 in (0.8 mm) in 12 in (305 mm) of total length and width.
 - e. Edge Trueness: Shall not deviate more than 1/32 in (0.8 mm) in 12 in (305 mm).
 - f. Face Flatness: Shall not exhibit any bowing of more than 1/32 in (0.8 mm) in total length.

WARNING: Any Insulation Board not meeting the above requirements should be rejected and not installed.

B. Preparation at Terminations

1. Wrapping (also referred to as back wrapping)
 - a. Apply a strip of Dryvit Detail Mesh along the horizontal terminations. Position the mesh so that a minimum of 2 1/2 in (64 mm) extends onto the face of the insulation board.
 - b. Attach Detail Mesh around the perimeter of all openings, penetrations, and other system terminations in the same manner.

C. Mechanical Fastener Attachment

1. Begin installation of the insulation board from a permanent or temporary support.
2. Beginning at the base of the wall install the insulation boards with their long edges oriented horizontally. Position insulation boards so that insulation board joints fall on ribs of the panel.
3. Secure the insulation board to the metal building substrate as noted in the design documents. It is the responsibility of the architect and/or engineer to determine that the mechanical fasteners and fastening patterns are acceptable for use with the project specific Metal Building Siding and wind load requirements. Fastener patterns are provided by Wind-lock Corporation.

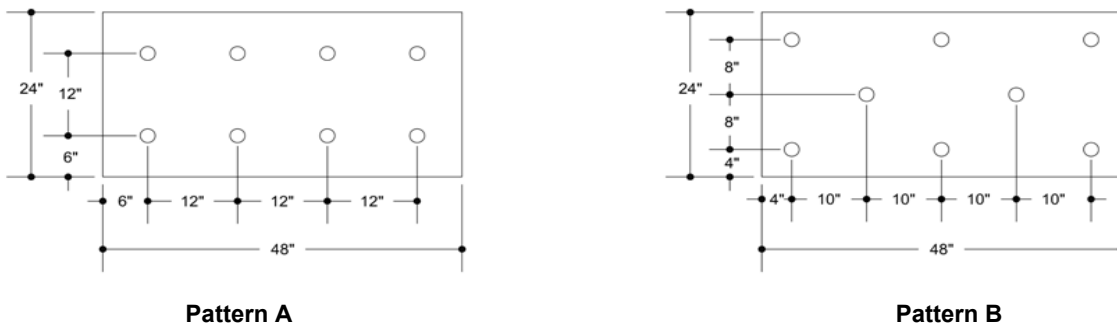


Figure 1

4. Install fasteners so that the face of the washer is flush or recessed a maximum of 1/16 in (1.6 mm) below the surface of the insulation board causing a slight dimple at each fastener location.
5. Install subsequent rows of insulation board in a running bond pattern with vertical joints staggered. The offset is suggested to coincide with the repeating pattern of the fasteners.
6. With factory edges exposed, stagger vertical joints at inside and outside corners. Make sure corners are straight and plumb.

E. Windows, Doors, Mechanical Equipment and all Wall Penetrations

1. Corners of Wall Penetrations
 - a. Because insulation board joints cannot align with corners of openings, first cut L-shaped pieces of insulation board for the corners of the opening. Then measure and cut the insulation board to the proper length to fit between the corner pieces over the opening.
2. Wrapping Openings
 - a. Attach Detail Mesh around the perimeter of the opening as described in Section VI.B.1.
 - b. Hold the insulation board back from the window/door frame or mechanical equipment to allow for differential movement, proper system edge preparation, and sealant installation as shown in the Dryvit Outsulation System Installation Details, [DS107](#).
4. Corners of all openings such as windows, doors, mechanical equipment and all penetrations shall be reinforced with Detail Mesh placed diagonally to the opening as illustrated in Figure 2.

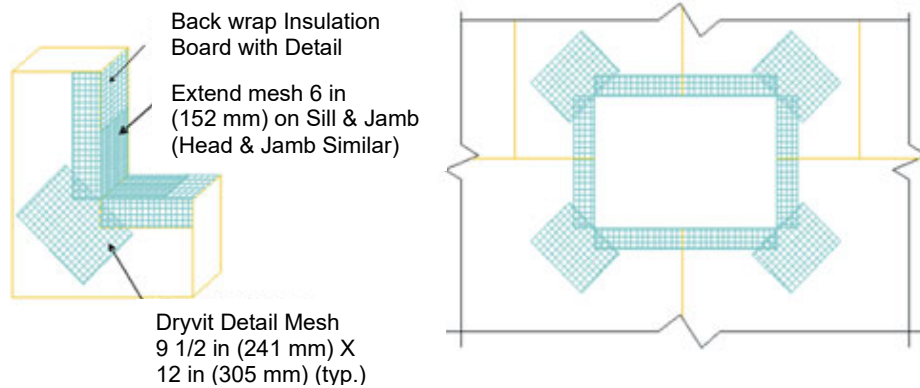


Figure 2

F. Expansion Joints

1. Attach Detail Mesh around the perimeter of the opening as described in Section VI.B.1.
2. When abutting dissimilar materials, leave a minimum 3/4 in (19 mm) separation between the insulation board and abutting material to allow for differential movement, proper system edge preparation and sealant installation.
3. When the Outsulation System is installed at a substrate transition, leave a minimum 3/4 in (19 mm) separation between the insulation boards to allow for differential movement, proper system edge preparation and sealant installation.

G. Slivering

1. If for any reason the insulation board joints are not butted tightly, slivers of insulation board must be installed to fill any gaps. **ALL GAPS GREATER THAN 1/16 in (1.6 mm) MUST BE SLIVERED. TIP: In order to create a tight fit, it is recommended that a wider joint be cut with a hot groover or similar tool to allow for a more precise fitting sliver.**

H. Aesthetic Reveals

1. To install an aesthetic reveal, snap a straight line using a chalk line to mark the location.
2. Position a straight edge such as a steel stud or track against the insulation board in the proper location to guide the appropriate cutting tool (router, hot knife, or hot groover). **CAUTION: The thickness of the insulation board in the bottom of the reveal must not be less than 3/4 in (19 mm).**
3. Use Detail Mesh to ensure continuity of reinforcing mesh through aesthetic reveals continuing a minimum of 2 1/2 in (64 mm) on each side of the reveal.
 - a. Apply the base material mixture in the reveal and on the adjacent insulation board surfaces.
 - b. Embed the Detail Mesh into base coat mixture on one side of the reveal only.
 - c. Use a sled or special tool configured to the profile of the reveal. Embed the Detail Mesh into the base coat mixture through the reveal being careful not to cut the mesh.

- d. Embed the Detail Mesh into the base coat mixture on the other side of the reveal. Ensure that the mesh is fully embedded and that all excess material is removed from the reveal.
- e. Using a damp brush, smooth out any irregularities in the base coat.
CAUTION: If the mesh is cut in the reveal, a new piece of mesh must be installed over the cut or cracks can occur.

I. Preparation of Insulation Board for Base Coat Application

1. Any irregularities in the insulation board surface must be sanded flat. Sanding is accomplished with a light circular motion. **The entire wall area must be sanded.** Use grade 20 grit sandpaper or coarser, in conjunction with hand, electric or air rasps. Use OSHA required masks to protect against inhaling EPS dust. **NOTE: Do not sand parallel to the insulation board joints.**
2. Remove all loose pieces of insulation board and dust from the sanding operation using a brush, broom, vacuum, or compressed air. Use OSHA required masks to protect against inhaling EPS dust.
3. With a stainless steel trowel spot all fasteners with the Genesis or Genesis DM mixture.
4. All Detail Mesh that was previously installed for back wrapping the insulation board shall be embedded in the base material mixture at this time.
 - a. With a stainless steel trowel, apply the base material mixture to the face (and edge if not previously coated) of the insulation board and embed the Detail Mesh in the wet mixture.
5. Where Corner Mesh is specified for additional impact resistance at outside corners, the Corner Mesh shall be embedded in the base coat mixture and allowed to set prior to installing the overall reinforced base coat over the face of the wall.

VII. Installation of Reinforcing Mesh and Base Coat

A. General

1. **Do not apply the Dryvit materials in the rain. The insulation board must be dry prior to applying the base coat material.**
2. Prior to installing the reinforced base coat, inspect the surface of the insulation board for:
 - a. Flatness: Use a minimum 8 ft (2.4 m) straight edge. Sand any high areas and out-of-plane board joints flat, as described in Section VI.I.2 and 3. **CAUTION: Do not build up low areas with base coat mixture to form a flat surface.**
 - b. Damage and foreign materials: correct deficiencies as necessary.
 - c. Surface degradation due to weathering or UV (visible as discoloration). Sand affected areas to remove deterioration while maintaining the flatness of the surface.
3. **Do not apply the Dryvit materials in the rain. The insulation board must be dry prior to applying the base coat material.**
4. Mix the base coat material as described in Section III.B.
5. Prior to installing the reinforcing mesh, it should be inspected to ensure that it has been furnished by Dryvit Systems, Inc.
 - a. Dryvit reinforcing mesh is available in the following widths and lengths:
 - 1) Standard - 48 in x 150 ft (1.2 m x 45.7 m); 72 in x 150 ft (1.8 m x 45.7 m)
 - 2) Standard Plus and Intermediate - 48 in x 150 ft (1.2 m x 45.7 m)
 - 3) Panzer 15 - 48 in x 75 ft (1.2 m x 22.9 m)
 - 4) Panzer 20 - 48 in x 75 ft (1.2 m x 22.9 m)
 - 5) Corner - 9 1/4 in x 150 ft (235 mm x 45.7 m)
 - 6) Detail - 9 1/2 in x 150 ft (241 mm x 45.7 m)

B. Base Coat Application

1. **All fasteners must be spotted with the Genesis or Genesis DM mixture prior to applying the base coat over the entire wall surface as noted in Section VI.I.3.**
2. Standard Base Coat (single layer of Standard, Standard Plus or Intermediate Reinforcing Mesh)
 - a. The base coat shall be applied such that the resulting overall minimum base coat thickness is sufficient to **fully embed** the reinforcing mesh. The recommended method is to apply the base coat in two (2) passes.
 - b. Double pass method (recommended)
 - 1) Using a stainless steel trowel, apply the base coat mixture on the entire surface of the insulation board to an area slightly larger than the width and length of a piece of reinforcing mesh, in a uniform thickness of 1/16 in (1.6 mm). **NOTE: The reinforcing mesh may be installed either vertically or horizontally.**

- 2) Immediately place the reinforcing mesh against the wet base coat mixture. With the curve of the mesh against the wall, trowel from the center to the edges avoiding wrinkles, until the mesh is fully embedded and not visible. Trowel smooth to a uniform thickness slightly more than the thickness of the reinforcing mesh. **NOTE: The reinforcing mesh shall be continuous at corners and mesh edges lapped not less than 2 1/2 in (64 mm). Do not lap the reinforcing mesh within 8 in (203 mm) of a corner. Tip: Corners and edges normally require light strokes with a small damp brush to smooth out irregularities.**
- 3) Allow the base coat mixture to take up until firm to the touch. Trowel a second tight coat of the base coat mixture over the first coat to **fully cover** the reinforcing mesh - Figure 3. The result should be such that the reinforcing mesh is approximately centered within the base coat thickness. Do not allow the first pass to completely dry prior to the second pass application or an excessive amount of base coat mixture will be necessary to fully coat the wall surface.

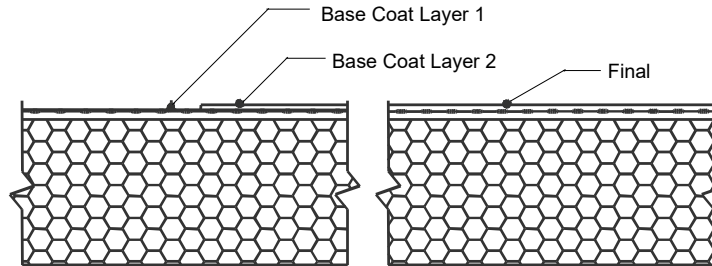


Figure 3

- c. Single pass method (optional)
 - 1) Apply the base coat as described in Section VII.B.2.b.1) and 2).
- d. Protect completed work from water penetration and runoff.
- e. Allow the base coat to cure a minimum of 24 hours before proceeding with application of finish coat. Cool, damp conditions may require longer drying times. Do not apply finish to a wet or damp base coat.
3. Panzer Mesh Base Coat (Panzer 15 or Panzer 20 used in conjunction with Standard or Standard Plus Reinforcing Mesh). **Panzer Mesh is recommended for use at all ground floor locations and at high traffic areas. Refer to contract documents.**
 - a. Using a stainless steel trowel, apply the base coat mixture on the entire surface of the insulation board to an area slightly larger than the width and length of a piece of reinforcing mesh, in a uniform thickness of approximately 1/8 in (3.2 mm).
 - b. Immediately place the reinforcing mesh against the wet base coat mixture. With the curve of the mesh against the wall, trowel from the center to the edges avoiding wrinkles until the mesh is fully covered and not visible.
 - c. Continue in the same manner until the entire area requiring Panzer Mesh is covered. **CAUTION: Do not lap the Panzer Mesh. Adjacent pieces are to be tightly butted.**
 - d. Protect completed work from water penetration and runoff.
 - e. Allow the Panzer base coat to cure a minimum of 24 hours prior to applying Dryvit's Standard or Standard Plus Reinforcing Mesh.
 - f. Apply the second layer of reinforcing mesh in accordance with Section VII.B.2.c. Offset the edges of the Standard or Standard Plus Reinforcing Mesh from the edges of the Panzer Mesh a minimum of 8 in (203 mm). **TIP: If Panzer Mesh is installed horizontally, we recommend the Standard or Standard Plus Mesh be installed vertically and vice versa.**

VIII. Sealant Joint Preparation

- A. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

IX. Dryvit Primers

- A. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

X. Dryvit Finish

- A. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

XI. Coatings and Sealers

- A. Refer to Dryvit Outsulation Application Instructions, [DS204](#).

XII. Maintenance and Repair

- A. Refer to DryvitCARE EIFS Repair Procedures, [DS498](#).

DISCLAIMER

Information contained in this document conforms to standard detail and product recommendations for the installation of the Dryvit Outsulation products as of the date of publication of this document and is presented in good faith. Dryvit Systems, Inc. assumes no liability, expressed or implied, as to the architecture, engineering or workmanship of any project. To ensure that you are using the latest, most complete information, contact Dryvit Systems, Inc. at:

One Energy Way
West Warwick, RI 02893
(401) 822-4100