FIELD INSTALLATION MANUAL

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INTRODUCTION

Prior to beginning installation of Build SMART components for your project, it is highly recommended to browse through this entire field installation manual, and to at least read the introduction that follows. Chapter 1 outlines some of the steps that need to be taken to prepare for the project, including a critical materials and equipment checklist. It will also be important to review design details and sections with the entire team and to highlight the importance of the air barrier.

Be sure to review complete construction, Passive House Planning Package (PHPP) and related documents to be certain of placement and alignment of all air and thermal barriers. It is CRITICAL that all of these barriers are installed and aligned per the approved plans, PHPP and energy models.

IT IS CRITICAL that all air barriers (typically the slab vapor barriers, the foundation wall systems and seams, OSB layer of the wall panels and OSB ceiling lids) are sealed completely and continuously, without voids or thin spots. All components which utilize sealants at their interfaces need to be joined together directly after sealant is applied (wet set). Constant inspection and monitoring of all assemblies during erection is critical and can help avoid the time-consuming process of chasing air barrier leaks later.

Chapters 2 and 3 cover J-form, slab, and precast foundation systems. For all such systems, all “deep plumbing” and any other laterals, utilities and conduits must be in place prior to the pouring of any concrete. Be sure to understand any issues of time sensitivity where certain procedures must be completed without interruption and the circumstances that dictate stopping the work to make corrections. The slab air/vapor barrier that remains exposed after the slab pour must be protected from damage to prevent difficult repairs later in the process. Also make sure to have the proper materials referenced in this manual on hand, including glues, air sealing products, foam inserts for at the top of the J-forms at the exterior doors, concrete/cement filler/repair products, and excess vapor barrier. Always follow code and manufacturer instructions, for and not limited to air sealing, concrete repair, further termite treatment (if necessary), soil compaction, damp proofing, and modifications to Build SMART components.

Chapter 4 concerns the delivery of Build SMART components. It is recommended to read Chapter 4 well in advance of delivery as it contains details on preparing the site for navigation of unloading equipment and delivery vehicles. Always follow safety protocols when using machinery and handling heavy loads. Immediately inspect all bundles upon delivery for order completeness and accuracy. If any parts are missing, incorrect, or damaged, Build SMART must be notified immediately, to provide prompt resolution.
Chapter 5 contains the detail of wall panels, floor band and roof band systems. Please examine this in detail to gain a thorough understanding.

Please refer to all of the standard details in the Appendices section at the end of this manual.

DISCLAIMER: This manual contains information that goes beyond instruction on how to install our products. That is because our Founder and Technical Director Adam Cohen and our Field Technical Manager Rob Leonard have years of experience building Passive House structures, and we have elected to share that free of charge as a courtesy to our customers. However, all designs and construction techniques are ultimately the responsibility of the designer and builder for the project. None of the materials and efforts presented are provided by Build SMART, LLC unless specifically stated in the customer’s purchase contract.
1. **Before Your Build SMART Components Arrive**

Congratulations on your decision to work with Build SMART for your latest project. Prior to the arrival of your Build SMART materials, there are a few steps that you as a builder will need to take to ensure a quick and problem-free installation. The checklist below summarizes the preconstruction process, with a full checklist for all project phases included in the appendices.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconstruction</td>
<td>☐ Verify understanding of PHPP calculations &amp; design requirements and review of project specific assemblies</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Basement insulation</td>
<td>Thickness, location, assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Slab insulation</td>
<td>Thickness, location, assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Wall insulation</td>
<td>Thickness, location, assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Roof/ceiling insulation</td>
<td>Thickness, location, assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Air barrier strategy</td>
<td>Location, assembly, transitions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Windows &amp; doors</td>
<td>Specs, assembly, air tightness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Shading &amp; exterior</td>
<td>Location, assembly, air tightness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Mechanical design</td>
<td>Layout, insulation, air tightness, flow requirements, structural integration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Plumbing design</td>
<td>Pipe lengths and DHW and water sense requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ PHIUS+ certification</td>
<td>1. Pre-certification prior to construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Energy Star requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Team preparation</td>
<td>Review and emphasize construction details</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Detailed section presentation</td>
<td>Educate field crew and build team on importance of air barrier continuity and integrity, demonstrate and display materials and products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Importance of air barrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Rater equipment, procedures, and milestones</td>
<td>Engage with rater prior to construction of project to define testing procedures, protocols, and timelines and explain rater value to team</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Preconstruction checklist

**NOTE: Variations from Build SMART building assembly details**

Any variation from Build SMART details, assembly directions, etc. shall be preapproved by Build SMART **in the form of written authorization from Build SMART**. If the builder or owner vary from any Build SMART authorized assemblies, they accept all responsibility stemming from such variation.

**NOTE: Factory Cut Roof and Floor Band component height dimensions and roof band angle cuts**

In order to assure that all floor and roof system Build SMART band components can be produced in the factory to final intended design dimensions for the floor band heights and roof band heights and roof band angles, the final project specific floor band height and roof band height dimensions as well as the angles of the roof bands will need to be issued to Build SMART, in writing by the purchaser at the time the purchase agreement is finalized by the purchaser and Build SMART. If the dimensions are not confirmed by the time of purchase it is likely that the band components will be sent in oversized dimensions which will need to be field cut by the purchaser’s installers. Field cutting can be time consuming and can result in poor quality cuts which can make field installation more difficult to install and properly seal.

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In addition to review of the design and calculations and preparation of the team, materials and equipment should be secured in advance for successful project completion. There is a checklist on the following two pages (also included in the appendices) with item descriptions, quantities required, and notes.
## FIELD ASSEMBLY EQUIPMENT and MATERIALS CHECKLIST for BUILDER

Field Carpentry Crew needs to be equipped with standard compliment of wood wall framing tools-Power and Hand

<table>
<thead>
<tr>
<th>X</th>
<th>Item Description</th>
<th>Quantity</th>
<th>Supplied By</th>
<th>Confirmed Delivered to site by</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Safety and MSDS Program, Training and Equipment</td>
<td></td>
<td></td>
<td>Specific to Project, implemented by Builder</td>
<td></td>
</tr>
<tr>
<td>16D Nails-Hand Nails</td>
<td></td>
<td>25 #</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8D Nails</td>
<td></td>
<td>25#</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gun Nails</td>
<td></td>
<td></td>
<td>Builder</td>
<td></td>
<td>16D, 8D type per Carpenter's equipment</td>
</tr>
<tr>
<td>20oz. Sausage Tube Gun(s)</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20oz. Cordless Sausage Tube Gun(s)</td>
<td></td>
<td></td>
<td>Optional</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>20oz. Standard Large Tube Caulk Gun(s)</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20oz. Cordless Standard caulk Gun(s)</td>
<td></td>
<td></td>
<td>Optional</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>Extra Sausage Gun Tips</td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build Smart Sealant</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Provided by Build Smart</td>
<td></td>
</tr>
<tr>
<td>Huber Zip Tape or Huber Fluid Applied Sealant</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Enough for Zip Wall Seams on Panels, per manufacturer's instructions</td>
<td></td>
</tr>
<tr>
<td>Titebond Polyurethane Glue 8oz. Bottles</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Moisture Cured Polyurethane Glue</td>
<td></td>
</tr>
<tr>
<td>Water Spray bottle</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>For Moiisting Moisture Cured Products</td>
</tr>
<tr>
<td>Case of 12 Large Tube Construction Adhesive</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>Band Adhesive</td>
</tr>
<tr>
<td>Rags</td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Jabber for Cleaning out Sausage Gun Tips</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spray Foam &amp; Foam Gun</td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting Straps</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Assorted Sizes including 8' sling</td>
<td></td>
</tr>
<tr>
<td>Lifting Plates</td>
<td></td>
<td>4</td>
<td>Builder</td>
<td></td>
<td>The following or similar, for panel lifting plate:Upgear Temporary Fall Protection Model#210402 (5000lb capacity), can be obtained at Home Depot</td>
</tr>
<tr>
<td>#10 x 2-1/2&quot; Hex Head Wood Screws</td>
<td></td>
<td>50</td>
<td>Builder</td>
<td></td>
<td>For Extra Lifting Plate Screws</td>
</tr>
<tr>
<td>Pressure Treated Sill Plates</td>
<td></td>
<td>Per Builder</td>
<td></td>
<td>Screed boards (if using J-forms). Ripped to total width of wall panel bottom plate and stud wall sheathing thickness</td>
<td></td>
</tr>
<tr>
<td>Wall Top Plates</td>
<td></td>
<td>Per Builder</td>
<td></td>
<td>Builder</td>
<td></td>
</tr>
<tr>
<td>Band or Ribbon Materials as required by Floor System Manufacturer</td>
<td></td>
<td>Per Builder</td>
<td></td>
<td>Builder</td>
<td></td>
</tr>
<tr>
<td>Flashing at Panel to Basement Wall</td>
<td></td>
<td>Per Builder</td>
<td></td>
<td>Field Bent Aluminum Metal Flashing Per Build Smart Detail at Build Smart Panel Band to Precast Basement, dimensions per specific project OR PROSOCO FastFlash applied to complete underside of Wall Panel or Band Panel 2IP/ EPS / OSB</td>
<td></td>
</tr>
<tr>
<td>Dryvit Rasp</td>
<td></td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Bars</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digging Bar</td>
<td></td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crow Bars</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; C-Clamps</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
</tr>
<tr>
<td>8&quot; C-Clamps</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
</tr>
<tr>
<td>12&quot; C-Clamps</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
</tr>
<tr>
<td>Build SMART Clamping Tool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Consult with Build SMART for details</td>
</tr>
<tr>
<td>Step Ladder-6'</td>
<td></td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ladder-8'</td>
<td></td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ladder-10'</td>
<td></td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 legged ladder</td>
<td></td>
<td></td>
<td>Optional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Protection Program, Training and Equipment</td>
<td></td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>Specific to Project, implemented by Builder</td>
</tr>
<tr>
<td>Impact Drill</td>
<td></td>
<td>1</td>
<td>Builder</td>
<td></td>
<td>Cordless Preferred</td>
</tr>
<tr>
<td>Hammer Drill</td>
<td></td>
<td>1</td>
<td>Builder</td>
<td></td>
<td>For Drilling Tacon</td>
</tr>
<tr>
<td>Cordless Drill Driver &amp; Assorted Bits</td>
<td></td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Description</td>
<td>Quantity</td>
<td>Supplied By</td>
<td>Confirmed Delivered to site by</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>GRK Brand &quot;R4-10x2-3/4&quot; or Similar</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Will be used Panel to Panel and Second Floor Sill Plates to Wood Floor System. Enough for Each Bottom Plate and end of panels and 2'-0&quot; OC and enough for vertical Panel to Panel Seams adjacent to top and bottom plate and then 2'-0&quot; OC</td>
<td></td>
</tr>
<tr>
<td>Bits for GRK Brand or Panel Screws</td>
<td>10</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tapcons - 1/4&quot; x 3&quot; Hex</td>
<td></td>
<td>Builder</td>
<td></td>
<td>For PT Sill Plates into concrete slab, confirm and specify type and spacing per local code official and requirements</td>
<td></td>
</tr>
<tr>
<td>Drill Bits and Driver for setting Tapcons</td>
<td>1 Set</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/16&quot; x 4-1/2&quot; Tapcon or Masonry Bits</td>
<td>N/A</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/16&quot; Hex Impact Hex Bits for setting Tapcons</td>
<td>N/A</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9 x2-1/2&quot; Wood Screws</td>
<td></td>
<td>Builder</td>
<td></td>
<td>For securing Build Smart Floor System Bands, Perpendicular to Trusses</td>
<td></td>
</tr>
<tr>
<td>#9 x3&quot; Wood Screws</td>
<td></td>
<td>Builder</td>
<td></td>
<td>For securing Build Smart Floor System Bands, Parallel to Floor Trusses &amp; Perpendicular Roof Trusses</td>
<td></td>
</tr>
<tr>
<td>Wedge Anchors/ Thunderstuds</td>
<td></td>
<td>Builder</td>
<td></td>
<td>For Final PT Sill Plate Setting into Concrete Slab, FINAL SIZING QUANTITY AND SPACING TO BE DETERMINED BY Builder, Depth Requirement Per Project Specific Assembly and Local Code Requirements</td>
<td></td>
</tr>
<tr>
<td>Wedge Anchors/ Thunderstuds Drill Bit</td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simpson “SWDC truss screw”</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Need Two per each end of roof truss</td>
<td></td>
</tr>
<tr>
<td><strong>Concrete Slab /Vapor Barrier:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Block Tape</td>
<td></td>
<td></td>
<td></td>
<td>Enough for Vapor Block Vapor Barrier Seams and Vapor Boots</td>
<td></td>
</tr>
<tr>
<td>Vapor Block Boots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive Undercoating</td>
<td>2 Cans</td>
<td></td>
<td></td>
<td>Enough for Vapor Block Penetrations</td>
<td></td>
</tr>
<tr>
<td><strong>J-Forms Prior to Walls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dryvit Primus or Genesis (NEEDS TO BE COMPLETED at THE ENTIRE J-FORM FACE AND FILLER STRIP PRIOR TO ANY WALLS BEING INSTALLED)</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Enough to cover top of J-Form and perimeter face of exposed J-Form, per manufacturer coverage rate</td>
<td></td>
</tr>
<tr>
<td>Dryvit Fiberglass Mesh (NEEDS TO BE COMPLETED at THE ENTIRE J-FORM FACE AND FILLER STRIP PRIOR TO ANY WALLS BEING INSTALLED)</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Enough to cover top of J-Form and perimeter face of exposed J-Form</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1 below shows an example of a panel lifting plate. Included in the appendices are product information sheets for various other equipment and materials.

**Fig. 1: Example of a panel lifting plate.**
2. **J-Form and Slab Systems**

The Build SMART J-form system is a quick and affordable insulation solution for high performance building foundations. Using this system allows for the building slab’s footing and slab edge to be thermally isolated from ground contact. It works in conjunction with the locally-purchased insulation that is placed in the excavation and that receives the slab pour. The J-forms are high density, termite treated insulation, and they cut out a number of steps for the contractor. In order for the J-form installation to be completed efficiently, the contractor should read and understand the following instructions for a successful installation.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab</td>
<td>Footing prep</td>
<td></td>
<td>Refer to applicable details, photos and drawings</td>
</tr>
<tr>
<td></td>
<td>Drain tile installed</td>
<td>Filter Socked Drain Tile</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td>Compact gravel</td>
<td>#68 or #57 gravel is acceptable for the gravel footer, but do not use anything smaller</td>
<td>8” Thickness (Verify with Local Code Official). ALL GRAVEL MUST BE LEVEL TO INSURE PROPER J-FORM Installation and wall panel installation erection and sealing.</td>
</tr>
<tr>
<td></td>
<td>Sand leveling bed installed</td>
<td>Some installers use well tamped gravel and forego the sand leveler</td>
<td>Thin Layer &lt;1” of cement sand/gravel over the gravel is best for leveling forms. ALL GRAVEL MUST BE LEVEL TO INSURE PROPER J-FORM Installation and wall panel erection and sealing.</td>
</tr>
<tr>
<td>J Forms (See additional detailed information in J-Form Narrative)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: J-form checklist and resources**

**BE SURE ALL** “deep plumbing” and any other laterals, utilities and conduits that need to be placed under footers are done so prior to installing J-form systems.
1. The trench excavation should allow for a minimum of 8” of engineer-specified gravel below the form. The final 2” should be a finer type of pea gravel (as allowed by engineer detail). Be sure all gravel is tamped and leveled. Check with local codes for required depth minimum.
Fig. 2: All deep plumbing and utilities installed, #57 or #68 gravel installed and compacted.

2. Perforated drainpipe with filter sock must be placed 4” from the outside of the trench and empty to a sump pit or daylight drain or according to local codes.
3. #68 or #57 gravel is acceptable for the gravel footer, but do not use anything smaller.
4. A thin layer (< 1”) of crushed stone sand or sand over the gravel is best for leveling forms (some experienced installers use well-tamped gravel and forego the sand leveler).
Fig. 3: Fine gravel installed and compacted. ALL J-FORMS MUST BE STRAIGHT AND LEVEL. Temporarily stake ends of J-form runs if adjacent J-form install lags < 3 minutes.

5. Start with inside and outside corner J-forms (similar to block foundation installation); by pre-assembling them using moisture cured polyurethane glue. Use protective gloves and eye protection with the glue. Moisten foam joints with H₂O to activate the foam adhesive using a spray bottle. Apply glue with disposable brushes or scrap wood.
6. The glue EXPANDS (similar to spray foam), so be sure forms are pinned at corners to prevent expansion.

7. Temporarily secure corners with 3'-0” grade stake dowels or similar.

**Fig. 6:** Be sure all corners are secured with temporary dowels to eliminate overall dimension creep created by expanding foam adhesive. Corners can also be preassembled and adhered, BE SURE ALL CORNERS ARE SQUARED.

8. Pre-assemble straight forms in runs up to 24’ long and infill between corners with straight forms as foam will expand. If work flow needs to break prior to corner to corner J-form completion then a temporary stake or dowel needs to be set at the end of the overall run, as foam adhesive will expand.
9. **ALL J-Forms MUST BE STRAIGHT AND LEVEL TO INSURE PROPER WALL PANEL ALIGNMENT AND INSTALLATION**

### SLAB PREPARATION PRIOR TO COMPLETING J-FORM INSTALLATION

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab</td>
<td>Slab section details-see project specific design and construction documents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Termite treated for ground contact</td>
<td>Type, thickness, order</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Under slab rough-in strategy</td>
<td>Location of MEP, load bearing / piers / footer locations. Install deep plumbing and other utilities under footer locations prior to preparing for footers</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ 10 mil Vapor Block 10, Vapor Bond and accessories</td>
<td><a href="http://www.buyplasticnow.com">www.buyplasticnow.com</a> OR Similar 1. Install with enough lap to tape joints together &amp; enough to lap the ends over the forms &amp; under the air shell wall 2. Tape to join the Vapor Sheets together</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Vapor boots &amp; vapor tape</td>
<td>Vapor Boot System &amp; Butyl Seal Tape <a href="http://www.BuyPlasticNow.com">www.BuyPlasticNow.com</a> OR Similar Order enough quantity to seal penetrations joints to the Vapor Block System</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Vapor barrier protection</td>
<td>Vapor Barrier System must be protected from penetrations during construction</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Additional undercoating sealant</td>
<td>Car undercoating Undercoating can be applied to the vapor barrier penetrations at areas difficult to address with tape (Check with other project certification requirements and restrictions to assure this is acceptable material)</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Wrap vapor barrier over J</td>
<td>Remove after pour and cover holes w/ tape</td>
</tr>
<tr>
<td></td>
<td>☐</td>
<td>☐ Multiple penetrations</td>
<td>1. Grouped penetrations are not recommended 2. May need “pitch pocket” strategy for grouped penetrations</td>
</tr>
</tbody>
</table>

---

**Table 3: Slab preparation checklist and resources**

**NOTE: Termite Treatment**

Although Build SMART slab and foam form systems are termite treated, there is no implied or direct warranty or guarantee of any pest control. Owners are encouraged to consult with their local building code requirements, lending institution requirements and a pest control expert.

The Build SMART EPS slab foam system is comprised of slab insulation that is purchased from local vendors by the builder, J-Forms for slab-on-grade construction, and precast foundation panels for basement designs. The system is a quick and affordable solution for high performance building foundations by providing thermal isolation from ground contact. The slab insulation is standard density EPS foam. It is termite treated insulation as are the J-forms and Build SMART basement foundation panels. In order for the installation to be completed efficiently, the contractor should read and understand these instructions for a successful installation.

**BE SURE ALL** “Deep plumbing” and any other laterals, utilities and conduits that need to be placed under footers are done so prior to installing J-form systems and basement wall systems.
Exploded and Assembly Drawing 2: J-Forms and Slab
10. Be sure that all under slab rough-ins are completed and terminated/temporarily sealed to a height that will accommodate the final utility trim out above the slab.
11. Gravel (#57) is to be installed at a minimum of 4” depth below the EPS Slab foam and at the correct elevation as per the Build SMART detail and cross sections and approved project details, documents and drawings. Be sure all gravel is level.
12. Review the slab EPS layout plans and sections to verify where the footer density and standard density foam are to be placed.
13. Install the EPS foam according to the layout, staggering the joints. If there are multiple layers of foam on the project, make effort to stagger the joints of each successive layer from the layer below.
14. Joints are to be installed as tightly as possible to minimize thermal breaks.
15. Once all of the EPS is installed, check the entire installation and seal any gaps that are 1/8” or greater with spray foam.
16. Prior to installation of air/vapor barrier, be sure all Slab Foam connections and seams are continuous and complete.
17. Prior to installation of Air/ Vapor Barrier be sure all pest and termite treatments required by local code, lender, owner are applied to sub-form and sub-slab soils and gravel.
18. Field check prior to install that all slab offsets, depressions, penetrations, rough ins, turn downs, portal frames and other hold downs etc. are complete and accurate. Trying make corrections later and repair Vapor / Air barrier later is possible but difficult.
19. Install vapor (air) barrier system as per manufacturer’s instructions. Use complimenting accessories, tapes and boots from manufacturer to complete the system, seal the seams and seal around all penetrations.

Fig. 7: Example of a vapor/air barrier boot system for vapor barrier penetrations.
20. Vapor (air) barrier must be continuous, complete and sealed throughout all vertical and horizontal assemblies of the slabs, footers, pier footings, etc.

21. Multiple tight penetrations are best grouped within a “pitch pocket” type of bulk headed system where the vapor barrier can be cleanly terminated to the small bulk head and turned upwards towards the top of the slab to where it can be sealed after the slab pour. The grouping of multiple penetrations can be encased in a liquid filled termination that can be sealed with fiberglass or other suitable resin to properly and fully vapor and air seal.

22. Protect all vapor barrier, including excess, during construction from penetrations and grinding in of any debris. Limit foot and construction activity traffic only necessary to complete pre-pour related activities.

23. For any transitions from slab to other floor assemblies, the vapor barrier needs to be turned up to allow for future termination and sealing above the slab and at the transition areas.

24. See J-form installation section for tips on allowing excess air barrier (vapor barrier) length.

25. When installing reinforcing materials, use plastic chairs and accessories to help insure there are no unintended vapor (air) barrier penetrations.

26. Wrap air (vapor) barrier into the forms leaving enough material to cover the bottom of the forms and overlap the outer edge of the J-form by 12” minimum, with enough excess length at all outboard edges so that once the concrete pulls the vapor barrier into the J-form there will be enough excess to overlap the outside edge of the J-form by minimum of 12”.

27. Temporarily install 2x PT plates on top of J-forms and Overlapped Vapor/ Air Barrier to form a concrete form / screed edge. Use 6” course thread screws to temporarily hold the 2x PT plate in place for the pour. Predrill holes for the screws and hand tighten them into the J-form. Screws should be snug. Do not use a mechanical driver so as not to strip foam from screw threads. The next greater dimensional 2x width of PT lumber than the wall panel plate widths should be considered (i.e., 2x4 wall panels to use 2x6 PT screed boards, 2x6 wall panels to use 2x8 PT screed boards), this will allow “ripping” of the temporary screed boards to the full width of the wall panel bottom plate/exterior sheathing dimension and can therefore be utilized for the slab/sill plate to receive the Build SMART wall panels.
Fig. 8: Vapor/air barrier placed over slab foam and into/over J-forms to allow excess for concrete to pull the barrier into the form and allow for enough to pull inboard after pour (see Fig. 11).

Fig. 9: PROSOCO R-Guard Joint & Seam Filler being applied approximately 1” to top of slab prior to slab vapor/air barrier being flipped onto top of slab.
Fig. 10: PROSOCO R-Guard Joint & Seam Filler applied to slab vapor/air barrier after vapor/air barrier is flipped to the top of the foundation. Take extra care at corners to keep cuts neat and sealant complete.

Fig. 11: Vapor/air barrier pulled inboard towards slab and PT sill plates installed with Tapcon or similar fasteners. EPS infill pieces installed on top of J-forms.

28. After the slab is prepped and poured, remove the temporary screed boards, which can then be ripped to the combined dimension of the Build SMART wall panel bottom plate/wall sheathing (i.e., 2x4 walls would be total ripped width of 4”).

29. PROSOCO R-Guard Joint & Seam Filler will then be applied to the top of the slab approximately 1” inboard of slab edge. **ALL SEALANTS TO BE APPLIED CONTINOUS, WITH NO VOIDS or THIN AREAS, approximately ½” bead, no less. All interfacing materials need to be wet set in sealants.**
30. Wrap vapor barrier over the top of the slab towards the interior. Apply two beads of PROSOCO R-Guard Joint & Seam Filler to top of vapor barrier, approximately 2” inboard of exterior slab edge. **ALL SEALANTS TO BE APPLIED CONTINUOUS, WITH NO VOIDS or THIN AREAS, approximately ½” bead, no less. All interfacing materials need to be wet set in sealants.**

31. Install PT sill plates onto the slab according to coordinated and approve drawing dimensions.

32. Temporarily install the sill plates utilizing low profile Tapcons (or similar). The final local code-required hold downs and fasteners will be installed after all the wall panels are installed.

33. Install the EPS infill pieces on top of the J-forms with moisture cured polyurethane glue after the slab is poured. Do not adhere EPS foam filler at door panel areas.

34. Install high density foam inserts at door locations.

35. Parge the top and face of J-forms with Dryvit fiberglass mesh and “Primus” or “Genesis.”

![Image](image_url)

**Fig. 12:** Example of high density foam installed to align with door panel areas.
Fig. 13: Fiberglass Dryvit mesh installed at face of J-form at over top of J-foam top filler.

Fig. 14: Dryvit Primus started to be coated at top of EPS filler strip and down the face of the J-form.
Fig. 15: Dryvit Primus started to be coated at top of EPS filler strip and down the face of the J-form.
3. **Precast Foundation Systems**

The Build SMART pre-cast basement system is a quick and affordable solution for high performance building basements. Using this system allows for the basement space to be finished to the same level of comfort and energy performance as the rest of the structure. The basements are insulated and come with an integral footing, cutting out a number of steps for the contractor. In order for the installation to be completed efficiently, the contractor must prepare the site for a successful installation.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement foundation</td>
<td>☐ Cast-in-place</td>
<td></td>
<td>Refer to applicable details, photos and drawings</td>
</tr>
<tr>
<td></td>
<td>☐ Slab/wall intersection</td>
<td></td>
<td>Location of bearing, detail, sub slab insulation, vapor barrier detail</td>
</tr>
<tr>
<td></td>
<td>☐ Vapor barrier connection</td>
<td>SIGA Dockskin primer, Wigluv tape, Vapor bond tape, Prosoco Joint &amp; Seam</td>
<td>Location, details</td>
</tr>
<tr>
<td></td>
<td>☐ Wall penetrations</td>
<td></td>
<td>Location, details</td>
</tr>
<tr>
<td>Build SMART Precast Walls</td>
<td>☐ Slab/wall intersection</td>
<td></td>
<td>Location of bearing, detail, sub slab insulation, VB detail, construction sequence</td>
</tr>
<tr>
<td></td>
<td>☐ Vapor barrier connection</td>
<td>SIGA Docks skin primer, wigluv tape.</td>
<td><strong>ALL</strong> underslab vapor Barrier is to be terminated and Sealed to the Interior of The Build SMART foundation wall systems, then the vertical joints are to be sealed to the top of the foundation wall and terminated at the underside of the floor framing system sill plate gasketing</td>
</tr>
<tr>
<td></td>
<td>☐ Terminating Seams to top of</td>
<td></td>
<td><strong>ALL</strong> underslab vapor Barrier is to be terminated and Sealed to the Interior of The Build SMART foundation wall systems, then the vertical joints are to be sealed to the top of the foundation wall and terminated at the underside of the floor framing system sill plate gasketing</td>
</tr>
<tr>
<td></td>
<td>foundation using Floor System Sill</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gasketing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Foundation preparation checklist and resources**

The following items must be completed and coordinated to ensure the project goes smoothly:

1. The excavation should be over-dug by contractor to comply with applicable safety requirements, a minimum of 24” on all sides for proper sealing of the joints. Trenches must be at least 32” wide at the base.
Fig. 16: Example of installed precast foundation.

2. Perforated drainpipe must be placed by the contractor 12” from the inside or outside of the basement wall leading to a sump pit or daylight drain or according to local codes.

3. The contractor must supply corner pins at all outside corners that accurately define the position of the foundation. If sufficient pins are not in place, the contractor will reimburse the supplier at a rate of $250.00 per hour to establish such pins.

4. The contractor shall prepare the work site and provide access to the work site for a tractor-trailer and a crane as per specifications set forth. Contractor is responsible for damage to sidewalks, driveways, etc. whenever equipment leaves public roadways to access the job site. Site access considerations include:
   a. No limitations in the approach to the site including bridges with weight or clearance limitations, lower overpasses, gravel or dirt roads, tight turning radius, steep grades, etc.
   b. At the site the truck will be able to access, turn around or departure access, unloading access from the side of the truck, etc.
   c. It is the responsibility of the purchaser to inform Build SMART of any local site access limitations prior to shipping. Any additional handling will result in additional shipping charges.

5. If the work site is not accessible or prepared in accordance with the specifications, the contractor agrees to pay any expense incurred by the supplier for crane, truck, crew, and other costs associated with preparing the site (i.e., bulldozer, loader, etc.)

6. Contractor is responsible for providing adequate protection for frost conditions that may occur as well as protecting the stone from freezing while the excavation is open.

7. Contractor, all employees and subcontractors of the contractor, shall comply with all applicable building codes and safety requirements. Contractor agrees to instruct the owner that the owner must comply with all applicable building codes when finishing or modifying in any manner the walls supplied by the supplier.
8. The contractor must prepare the work site according to the specifications and supply a minimum of 6” of clean ½” crushed gravel over the entire floor of excavation and must be level to within +/– 1”.

9. If the site is not prepared according to the specifications or the gravel is not level within +/– 1”, the contractor will be charged and agrees to pay the supplier at a rate of $250.00 per hour for lost time.

10. For any job requiring a crane larger than 50 tons, or a reach exceeding 60’, the contractor agrees to pay additional cost.

11. The slab and floor framing diaphragm must be installed prior to backfilling the foundation.

12. Prior to installing the wood floor system gasket and wood sill plate, be sure that the top surface of the concrete foundation is clean and level. Check all holes, pockets, and voids. Pay special attention to voids that could create air barrier breaches at the sill gasket area. Voids, pockets, etc. can be filled with Quickrete FastSet Concrete Repair or Quickrete Quick-Setting cement or similar. Be sure to follow manufacturer’s instructions for application and verify if the product you select requires a fortifier or bonding agent.

13. Seal the top terminated edge of the under slab vapor (air) barrier to the interior of the foundation walls completely and without voids. SIGA Dockskin primer and SIGA Wigluv tape or similar products can be used to seal and tape the vapor barrier to the foundation wall. Follow manufacturer’s installation instructions.

14. Seal ALL vertical seams to the interior of the foundation walls completely and without voids. SIGA Dockskin primer and SIGA Wigluv tape or similar products can be used. Follow manufacturer’s installation instructions.

15. Terminate the vertical seam tape at the top of the foundation wall by applying two runs of primer and tape across the top of the foundation walls completely and without voids so that it can be capped by the floor system sill and sill gasket, which brings the air barrier to the outer face of the wood floor system sill plate. SIGA Dockskin primer and SIGA
Wigluv tape or similar products can be used. Follow manufacturer’s installation instructions.

Fig. 18: Example of installed precast foundation with interior wall seams taped and sealed and terminated at the top of the wall with horizontal primer and tape that will interface with floor system sill gasket.
Fig 19: Wood floor system sill plate gasketed over top of precast basement foundation system tape and primer cap.

16. Compaction of soil adjacent to the foundation is not recommended. If you intend to backfill with solid compaction adjacent to foundation, this must be approved by manufacturer prior to backfill.
17. It is recommended that the backfill be self-compacting gravel.
18. Apply foundation damp proofing in accordance with manufacturer instructions, approved construction documents and code requirements.
4. **Panel Delivery**

The Build SMART wall panels and bands (panels without stud-wall framing) are packed on a skid system and wrapped in sheet poly that protects during shipping and storage on the site. If your order includes loose shipped windows and doors that are to be field installed, they will ship in separate crates that will arrive with the panels and the bands. The window and door hardware will also arrive with the shipment in small shipping boxes.

1. The Sales Agreement establishes the estimated ship date. Please allow at least two weeks prior to the Estimated ship date to arrange a specific shipping date.
2. Please confirm with Build SMART that there is adequate site space to accommodate:
   a. Delivery access
   b. Delivery vehicle departure
   c. Offloading area
   d. Storage footprint to accommodate all packages and panel packages
   e. Dry protected storage for loose ship items

![Fig. 20: Example of wall panel packages.](image-url)

3. The panels will arrive on a full size flatbed truck that will have at least a 48’ trailer.
4. Please be sure that the truck will have access to the site, including:
   a. No limitations in the approach to the site including bridges with weight or clearance limitations, lower overpasses, gravel or dirt roads, tight turning radius, steep grades, etc.
   b. At the site the truck will be able to access the unloading area, will have turn around or departure access, and unloading access from the side of the truck, etc.
   c. It is the responsibility of the purchaser to inform Build SMART of any local site access limitations prior to shipping. Any additional handling will result in additional shipping charges.
5. When receiving date is confirmed, please arrange for your field personnel to be on site to receive the wall panels and bands.
6. The panel packages will typically be shipped in vertical packages. Custom panels, floor and roof bands will typically arrive in horizontal packages.

7. All packages must be inspected prior to off-loading and any damage must be photo documented and reported to the shipping driver and Build SMART immediately, as well as noted on the receiving ticket.

![Image of wall panel packages unwrapped on level site.](image)

**Fig. 21: Example of wall panel packages unwrapped on level site.**

8. Check that all contents are complete per packing slip and shipping confirmation.

9. The packages are best unloaded with an all-terrain construction fork lift from the side of the flat bed.

10. Panel packages must be stored on a flat, firm, well-draining or rain-protected surface.

11. Sites that are not firm, not level or exposed to windy conditions will require that the packages be braced with bracing members staked to the ground.

12. Please make arrangements for safe, dry and secure storage of the loose ship items which could include small boxes of sealants, window and door hardware, crated loose windows and doors for field installation.
5. Panel Installation

The Build SMART wall system is a quick and affordable solution for high performance buildings. Using this system allows for the simultaneous installation of the structural wall, air barrier, exterior insulation, nail base, weather resistant barrier and pre-installed and pre-airtighted windows and doors. The walls come in pre-manufactured sections, cutting out a number of steps for the contractor. In order for the installation to be completed efficiently, the contractor should completely read and understand the following instructions for a successful installation. Please refer to all details and photos in this section and other related sections of the manual. It is critical that all foundation, slab and floor systems be straight, square and level for wall panels and band systems to interface correctly.

Exploded and Assembly Drawing 3: Wall Panels on Slab
Exploded and Assembly Drawing 4: Outside Corner Wall Panels on Slab
Exploded and Assembly Drawing 5: Inside Corner Wall Panels on Slab
NOTE: REFER TO SEQUENTIAL DIAGRAMS FOR MORE INFORMATION ABOUT EACH COMPONENT OF THE BUILD SMART SYSTEM.

NOTE: ALL BUILD SMART FORMS AND SLAB TO BE INSTALLED SQUARE AND LEVEL COMPLETELY TO ASSURE EFFICIENT PLUMB AND LEVEL ASSEMBLY OF BUILD SMART PANELS.

Exploded and Assembly Drawing 6: 3 Story Wall Panels System
Exploded and Assembly Drawing 7: Roof and Ceiling System
<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build SMART Wall &amp; Roof</td>
<td>Frame walls on slab</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Install pressure treated bottom plate that is ripped equal in width to the full width of the exterior framed wall studs and exterior OSB sheathing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Install sealant on slab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Wrap under slab poly air barrier over sealant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Install sealant on poly air barrier</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Install pressure treated bottom plates with exterior OSB rip on poly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Ensure plates are square and level</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>6. Install bottom plates installed in seamless manner</td>
</tr>
<tr>
<td></td>
<td>Frame walls on wood</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Install structural insulated band @ the exterior perimeter of floor system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Install sealant on top of basement wall/insulated band intersection</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2. Install construction adhesive on top and bottom ribbon boards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Screw insulated band from interior as per engineering details</td>
</tr>
<tr>
<td></td>
<td>Install vertical sealant at band panel to band panel</td>
<td>Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All frame walls/roof</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Begin at corner and apply horizontal sealant to pressure</td>
<td>Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply vertical sealant at panel to panel OSB Air Barrier</td>
<td>Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply two vertical beads of Construction Adhesive at</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fasten Panels together with Structural Screws</td>
<td>GRK-R4-10x2-3/4&quot; or Equal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Install screws starting at within 3&quot; from bottom of top plate and within 3&quot; from top of bottom plate and then 2'-0&quot; OC</td>
</tr>
<tr>
<td></td>
<td>Inspect wall panel foam to foam for gaps. Apply spray foam to gaps of 1/8&quot; or greater</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Inspect from top of panels once all panels are set</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Mark face of panels that have gaps of 1/8&quot; or greater</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Drill series of holes large enough to accept spray foam nozzle starting at 3&quot; from bottom of panel and the 16&quot; OC to top</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Work from bottom hole to top and insert spray foam nozzle and insert foam to be sure it fills the entire seam. Work spray nozzle to interior of panel and pull out as foam fills</td>
</tr>
<tr>
<td></td>
<td>Seal WRB zip sheathing with tape or liquid sealant</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ZIP Wall seam &amp; wall fastener inspection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension</td>
<td>Top plate ZIP cap must be nailed to top plate &amp; installed at least 2&quot; beyond interior of top plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension sealing</td>
<td>Dockskin primer, Wigluv tape, Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Be Sure that top plate cap is continuously sealed with tape or liquid sealant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Do not forget to seal bottom of butt joints between OSB cap extension</td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension inspection after truss setting</td>
<td>After trusses are set be sure that the seal is not breached and repair any breaches</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Application &amp; sealing of OSB or ZIP to ceiling</td>
<td>Dockskin primer, Wigluv tape, Prosoco Joint and Seam or ZIP Sealants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. OSB or ZIP applied to bottom chords of trusses with screws, be sure all screws go into chords</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. All seams need sealing with OSB or ZIP compatible TAPE &amp; primer or liquid sealant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. All fasteners must be sealed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Inspect all</td>
</tr>
<tr>
<td></td>
<td>Bottom plate penetrations</td>
<td>Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All anchor bolts and other bottom plate penetrations are sealed</td>
</tr>
</tbody>
</table>

Table 5: Wall panel checklist and resources
The ease of installation of this product is directly related to the surface it is bearing on. **It is critical that the bearing surface be square and level. This will greatly speed the installation of the panels. Making the effort to square and level your bearing surface is well worth the time.**

Be sure all sealants, tapes and gaskets are applied and installed per manufacturer’s instructions. Be sure all components are assembled in a wet set of the sealant, do not allow sealant to begin to cure prior to setting adjoining components. NO “cold joints.”

1. Please read, understand and utilize the following overall protocol throughout the erection and installation process:
   a. Follow all sealant manufacturers’ application and installation instructions.
   b. All air barriers must align and all air barriers and connections must be sealed continuously and completely, **NO EXCEPTIONS.** Do this as the construction occurs (very difficult to “come back” to an air barrier connection repair).
   c. Inspect all connections during each assembly installation to catch ANY breaches in sealants or air barrier connections. View all adjoining surfaces from all visible sides and junctions.
   d. Once each assembly phase is completed, then the complete assembly needs to be inspected from all visible sides to identify any breaches or potential penetrations and corrected prior to moving onto the next phase. Air and thermal penetrations are far easier to repair “as you go.”
   e. Apply the PROSOCO Joint and Seam sealant on any fastener penetrating an air barrier.
   f. All exterior fasteners which breach the air barrier must have PROSOCO Joint and Seam sealant applied or assurances that the fasteners have made a full stud or plate connection.
   g. All wall assemblies are to be lifted onto sealants to best prevent sealants from being scraped off. Inspect sealants at each wall panel installation to be sure sealants are complete. Prevent “cold joints” between panel sill sealants from panel to panel. If there is a work break between wall panel installations be sure sealants are scraped to properly receive the next adjacent panel.
   h. It is imperative, to best assure airtightness, that the panel to panel connection sealants need to be applied continuously and completely at OSB to OSB air barrier connections. **ALL SEALANTS NEED TO BE CONTINUOUS.**
   i. All wall panels are to be plumbed and braced at each end and no greater than 8’-0” o.c. as each panel is erected.
   j. Any panel greater than 10’-0” in height or with a hinge point from panel below will need an appropriate length brace that will not exceed a 60 degree angle from the bracing connection and shall have a counter purlin type of brace to prevent any excess brace flexing.
   k. All sill plate junctions need to be filled completely and continuously top to bottom and side to side with PROSOCO Joint and Seam sealant.
   l. Start panel installation with a corner panel.
m. Continue to check overall exterior wall line dimension string as you proceed. Occasionally the foundation or floor system will vary from the overall combined wall panel dimensions. Please refer to the appropriate section of this manual for the remedy.

n. Wall top plates at outside faces need to be sealed continuous to the top portion of the OSB wall panel air barrier. Please refer to drawing details and diagrams.

o. Once all panels are installed, perform inspection of installation from all sides to be sure all sealants are complete and EPS does not have voids in excess of 1/8”.

Critical inspection is best viewed from the top of the wall panel connections prior to final top plate being installed. Apply additional PROSOCO Joint and Seam at areas that are not filled to the top. Areas where the EPS to EPS voids are greater than 1/8” need to be marked at an easily viewed area of those panels at the face of the ZIP wall.

i. EPS voids in excess of 1/8” between adjacent panels need to be foam filled from the bottom to the top by way of drilling holes large enough for the spray foam application nozzle to access the EPS void. Drill holes immediately adjacent to the top and bottom plates and then 16” o.c. between top and bottom. Starting from the bottom inject spray foam from the back of the EPS closest to the EPS and keep working and filling each successive hole to the top.

Fig. 22: Inspect all junctions to be sure all sealants and foam are connected and complete.
p. Additional thermal barrier and air barrier performance assurances can be inspected through infrared camera testing by creating a minimum 18 degree $\Delta T$ for a minimum of 18 hours once the air envelope is complete. Thermal and air barrier penetrations, breaches and leaks should be corrected prior to ZIP tape installation.

2. Preparing to install Build SMART wall panels on a Build SMART slab system:
   a. Install sealant on top slab edge and wrap slab poly air barrier over sealant.
   b. Install sealant on poly air barrier and install ripped pressure treated bottom plate prior to wall installation. It is critical that the plate be square and level. Install bottom plates and seal all butt seams with sealant.
   c. Inspect all bottom plate penetrations. Seal all anchor bolts and other bottom plate penetrations.
   d. Install flashing/termite shield or PROSOCO Fast Flash to the underside of wall panel EPS/ZIP (as applicable to specific project details or requirements) between J-form and bottom of wall panel.
   e. Proceed to Step 4.

3. Installing floor band system at framed floor systems:
   a. Be sure all floor systems are installed per project specific design, details, drawings, local code requirements and manufacturer instructions.
   b. Be sure all foundation coatings and flashing systems are installed per project specific design, details, drawings, local code requirements and manufacturer instructions section and applicable drawing details in this manual.
   c. Install floor system to foundation sill plates and seal all butt seams with PROSOCO Joint and Seam sealant. It is critical that the sill plate be square and level. Be sure floor system sill gaskets are in place, complete, without voids and connected to the foundation system air sealing tapes and sealants.
   d. Be sure all foundation coatings and flashing systems are installed per project specific design, details, drawings, local code requirements and manufacturer instructions section and applicable drawing details in this manual.
   e. Coat bottom of all Build SMART bands with PROSOCO Fast Flash that will be in contact with foundation systems.
f. Apply PROSOCO Joint and Seam sealant continuously and without voids to the floor system sill plate connected to the foundation to continue the air barrier per manual details and sections and project drawings. Be sure to wet set the Build SMART bands into the PROSOCO Joint and Seam sealant prior to sealant curing.
Fig. 24: Sealant applied to foundation to connect wood floor system air barrier to band system air barrier.

g. Be sure that all the OSB layers at the Build SMART band are sealed completely and continuously with PROSOCO Joint and Seam to the wood floor sill/foundation connection to assure continuity of the air barrier.

h. Apply adhesive to the ribbon or floor framing system per drawing detail in this section and project specific drawing sections and details.
Fig. 25: Adhesive applied to wood floor system ribbon to adhere Build SMART panel to wood floor system.

Fig. 26: Sealant applied to connect lower level wall panel air barrier to band system air barrier.
i. Fasten the Build SMART bands from the interior as per section details in this manual and applicable project specific drawings and specifications.

j. As the floor bands are being installed, be sure that all vertical band to band OSB seams are sealed completely with PROSOCO Joint and Seam.

k. Install and sheath the floor system per design and project specific documents. It is critical that the floor system be square and level.

l. Floor trusses need to be designed with a top and bottom ribbon board per detail.

m. Proceed to Step 4.

4. Installing Build SMART wall panels:
   a. The OSB layer is the air barrier component of the assemblies, so it is critical that all OSB edges receive continuous and complete sealants at all OSB connections.
   b. The PROSOCO Joint and Seam sealant must be a continuous in an even bead approximately ¾" wide. Apply the horizontal sealant 2” longer than wall length you are setting.
   c. Install PROSOCO Joint and Seam sealant at ALL OSB panel to panel and band connections.
   d. Fasten bottom plates of walls as per code requirements. Minimum needs to be GRK R4-10x2-3/4” structural screws or equal at the end of each panel and no greater than 2'-0” o.c.
   e. Apply PROSOCO Joint and Seam to the OSB top edge of the Build SMART band/wood floor system area where the underside of the Build SMART wall panel OSB will interface with the band OSB. If it is a slab system be sure the top side at the outermost edge of the sill plate has the bead of PROSOCO Joint and Seam applied where the underside of the wall panel OSB will interface. Be sure sealant is COMPLETE FROM TOP TO BOTTOM AND CONTINUOUS WITHOUT VOIDS.
   f. Begin at a corner and apply PROSOCO Joint and Seam sealant to pressure treated bottom plate/wall bottom plate intersection or the floor system/wall bottom plate intersection at the stud/OSB interface.
   g. Apply PROSOCO Joint and Seam to the OSB vertical side edge of the corner panel at the side of the next adjacent panel to be installed. Be sure sealant is COMPLETE FROM TOP TO BOTTOM AND CONTINUOUS WITHOUT VOIDS.
   h. Stand the next panel up adjacent to the corner.
   i. TAKE CARE NOT TO SCRAPER ANY PROSOCO JOINT AND SEAM OFF ANY OF THE VERTICAL OR HORIZONTAL CONNECTIONS.
   j. Stand all adjoining panels to a clearance of about 1” apart from the previously installed panel and be sure underside of OSB at wall panel lands squarely on the Joint and Seam sealant at the band or slab sill plate, then laterally slide panel to abut the adjacent panel.
   k. Fasten panels together with GRK R4-10x2-3/4” structural screws or equal. Install screws just above the bottom plate and below the top plate and 2'-0” o.c. maximum spacing along the length of the mating studs.
1. Once the walls are set, install a second top plate to align and tie the wall panels. Brace the wall panels at a minimum of 8’-0” o.c. Straighten and align the walls using standard construction methods, processes, tolerances and standards.

m. If there is another floor repeat Step 4, if not proceed to Step 5.

Fig. 27: Example of corner panel being prepared to set.
Fig. 28: Example of wall panel being transported to be set with all terrain lift and lifting plates/sling.
Fig. 29: Example of wall panel corners and wall panels set.
Fig. 30: Example of wall panel with door being set, note that door panel is set directly to slab with sill plates cut to accommodate door panel.

Fig. 31: Example of wall panel air barrier (vertical OSB edge) sealant being applied.
Fig. 32: Example of sill sealant to interface with wall panel air barrier (horizontal wall panel OSB) being applied.

Fig. 33: Temporary block installed to allow levering panel tightly to adjacent panel.
Fig. 34: Temporary angle clips and C-clamps to assist in fitting panels tight.

5. Installing the Build SMART roof band and complimenting ceiling system:
   a. After installing the second top plate atop the Build SMART wall panel top plate, install the OSB or ZIP top plate cap extension. This is a rip of 7/16” sheet goods (OSB, plywood or ZIP). Top plate cap extension must be nailed to top plate & installed at least 2 ½” beyond the interior of the wall top plate, so a 2x4 wall would have rips of 6” (minimum) x 8’ of sheet goods.
   b. Be sure that top plate cap is continuously sealed with tape or liquid sealant to the OSB layer of the Build SMART panel. Do not forget to seal the bottom of butt joints between OSB cap extensions to prevent air bypass at the butt joints.
   c. Set the roof trusses on the top plate cap extension. Install Simpson “SWDC truss screw” or equal for required hold down. (NOTE: standard roof hold down clips will not interface with the air barrier ceiling system) After trusses are set, inspect the installation to verify that the seal is not breached and repair any breaches. Care should be taken to minimize breaches during installation.
   d. Install the roof sheathing and temporary roof protection.
   e. Install the air tight “lid” with OSB or ZIP applied to the bottom chords of trusses with screws, be sure all screws go into chords.
   f. Seal all seams in the OSB with compatible primer and tape or liquid sealant. If using ZIP system, utilize ZIP system sealants per manufacturer’s instructions. All fasteners should be sealed.
6. Conduct the first air test after all air barriers are completely sealed and installed. After successful completion of the air test install the Build SMART insulated roof band as per engineering requirements.

7. Seal the entire project exterior WRB ZIP sheathing with tape or liquid sealant per manufacturer’s instructions.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Framed Wall &amp; Roof</td>
<td>Frame walls with ZIP wall air</td>
<td>Conservation Technology <a href="http://www.conservationtechnology.com/">http://www.conservationtechnology.com/</a></td>
<td>Bottom plates installed in seamless manner</td>
</tr>
<tr>
<td></td>
<td>Bottom plate gasketing</td>
<td>If glue is to be applied it must be continuous and even bead at all studs and plates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verify if glued ZIP wall or sheathing is required</td>
<td>One door opening is allowed for access and to facilitate blower door set up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be sure all sheathing is complete from bottom of wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be sure all exterior sheathing tape is applied at all wall air barrier</td>
<td>Huber ZIP wall Prosoco coatings</td>
<td>ZIP tape with squeegee at ZIP wall. Alternates include Prosoco coatings, tape on OSB with primer (refer to assembly plan callouts)</td>
</tr>
<tr>
<td></td>
<td>Slab vapor barrier to ZIP wall</td>
<td>Wigluv &amp; Dockskin Primer (<a href="http://www.smallplanetworkshop.com">www.smallplanetworkshop.com</a>) or Vapor Barrier Butyl Tape (<a href="http://www.buyplasticnow.com">www.buyplasticnow.com</a>)</td>
<td>Be sure vapor barrier and ZIP wall are taped &amp; sealed together both at the seam of tape/ZIP wall prior to folding up the ZIP wall and after the vapor barrier is lapped up to the ZIP wall INSPECT ALL VAPOR BARRIER &amp; REPAIR ANY BREACHES &amp; HOLES</td>
</tr>
<tr>
<td></td>
<td>Wall seam &amp; wall fastener inspection</td>
<td>1. Inspect that all seams are taped &amp; tape is not wrinkled or breached 2. Be sure all fasteners are sealed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension</td>
<td>Top Plate Zip Cap must be nailed to top plate &amp; installed at least 2” beyond top plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension taping</td>
<td>Be Sure that Top Plate Cap is continuously taped to wall sheathing at exterior with Zip Tape</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top plate ZIP cap extension taping inspection after truss setting</td>
<td>After Trusses are set be sure that the Tape is not breached and repair any breaches CARE SHOULD BE APPLIED WHEN SETTING TRUSSES TO MINIMIZE BREACHES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Application &amp; sealing of OSB to ceiling</td>
<td>1. OSB applied to bottom chords of trusses with screws, be sure all screws go into chords. 2. All seams need sealing with OSB compatible TAPE &amp; primer 3. All fasteners must be sealed 4. Inspect all</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bottom Plate Penetrations</td>
<td>All anchor bolts and other bottom plate penetrations are sealed with polyurethane caulk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frame walls – exterior insulation</td>
<td>Install vinyl termite shield</td>
<td>Not required for Rockwool</td>
</tr>
<tr>
<td></td>
<td>Min ½”ft fall @ window sills</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Wall panel installation checklist and resources
## Appendices

### a. Project Checklists

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconstruction</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
<td>Thickness, location, assembly</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Basement insulation</td>
<td>Thickness, location, assembly</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Slab insulation</td>
<td>Thickness, location, assembly</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Wall insulation</td>
<td>Thickness, location, assembly</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Roof/ceiling insulation</td>
<td>Thickness, location, assembly</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Air barrier strategy</td>
<td>Location, assembly, transitions</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Windows &amp; doors</td>
<td>Specs, assembly, air tightness</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Shading &amp; exterior</td>
<td>Location, assembly, air tightness</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Mechanical design</td>
<td>Layout, insulation, air tightness, flow requirements, structural integration</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Plumbing design</td>
<td>Pipe lengths and DHW and water sense requirements</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>PHIUS+ certification</td>
<td>1. Pre-certification prior to construction</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Team preparation</td>
<td>2. Energy Star requirements</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Detailed section presentation</td>
<td>Review and emphasize construction details</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Importance of air barrier</td>
<td>Educate field crew and build team on importance of air barrier continuity and integrity, demonstrate and display materials and products</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Testing equipment</td>
<td>Demonstrate testing and equipment and explain their value throughout the construction process</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
</tbody>
</table>

### Slab

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
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<tbody>
<tr>
<td>Slab</td>
<td>Build SMART J Form Passiv Foundation System</td>
<td>Refer to applicable details, photos and drawings</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Footing prep</td>
<td></td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
</tr>
<tr>
<td></td>
<td>Drain tile installed</td>
<td>Filter Socked Drain Tile</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td>Compact gravel</td>
<td>#6 or #57 gravel is acceptable for the gravel footer, but do not use anything smaller</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td>Sand leveling bed installed</td>
<td>Some installers use well tamped gravel and forego the sand leveler</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td>J Forms (See additional detailed information in J-Form Narrative)</td>
<td></td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td>J Form glue</td>
<td>Titebond Polyurethane glue: Franklin International Obtained from: <a href="http://www.demandproducts.comTB12">www.demandproducts.comTB12</a> Polyurethane glue 12 oz. OR Similar Moisture Cured Polyurethane Glue</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Use Protective Gloves</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Moisten foam joints with H2O using spray bottle</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Apply glue with disposable brushes</td>
<td>Daylighted on initial excavation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. This glue EXPANDS (like spray foam) be sure forms are pinned prevent expansion.</td>
<td>Daylighted on initial excavation</td>
</tr>
</tbody>
</table>

### PHASE

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<tr>
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<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
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</thead>
<tbody>
<tr>
<td>Precess</td>
<td>Verifying understanding of PHPP calculations and design requirements and review of project specific assemblies</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
<td>Preconstruction Planning with Designer, Architect, Engineer, Contractor, CPHC and all Raters is critical</td>
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<td>Air barrier strategy</td>
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<td>2. Energy Star requirements</td>
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</tr>
<tr>
<td></td>
<td>Detailed section presentation</td>
<td>Review and emphasize construction details</td>
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</tr>
<tr>
<td></td>
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<td>Testing equipment</td>
<td>Demonstrate testing and equipment and explain their value throughout the construction process</td>
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</tr>
</tbody>
</table>

### Phases

#### Preconstruction
- Verify understanding of PHPP calculations & design requirements and review of project specific assemblies
- Basement insulation
- Slab insulation
- Wall insulation
- Roof/ceiling insulation
- Air barrier strategy
- Windows & doors
- Shading & exterior
- Mechanical design
- Plumbing design
- PHIUS+ certification
- Team preparation
  - Detailed section presentation
  - Importance of air barrier
  - Testing equipment

#### Slab
- Build SMART J Form Passiv Foundation System
- Drain tile installed
- Compact gravel
- Sand leveling bed installed
- J Forms (See additional detailed information in J-Form Narrative)
- J Form glue

### J Form glue
- Titebond Polyurethane glue: Franklin International
- Obtained from: www.demandproducts.com
- TB12 Polyurethane glue 12 oz. OR Similar Moisture Cured Polyurethane Glue
- 1. Use Protective Gloves
- 2. Moisten foam joints with H2O using spray bottle
- 3. Apply glue with disposable brushes
- 4. This glue EXPANDS (like spray foam) be sure forms are pinned prevent expansion.
### Slab

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab section details-see project specific design and construction documents.</td>
<td>Refer to applicable details, photos and drawings</td>
<td></td>
</tr>
<tr>
<td>☐ Product layers</td>
<td>Termite treated for ground contact</td>
<td>Type, thickness, order</td>
</tr>
<tr>
<td>☐ Under slab rough-in strategy</td>
<td>Location of MEP, load bearing / piers / footer locations. Install deep plumbing and other utilities under footer locations prior to preparing for footers</td>
<td></td>
</tr>
<tr>
<td>☐ Vapor barrier</td>
<td>10 mil Vapor Block 10, Vapor Bond and accessories <a href="http://www.buyplasticnow.com">www.buyplasticnow.com</a> OR Similar</td>
<td>1. Install with enough lap to tape joints together &amp; enough to lap the ends over the forms &amp; under the air shell wall 2. Tape to join the Vapor Sheets together</td>
</tr>
<tr>
<td>☐ Vapor boots &amp; vapor tape</td>
<td>Vapor Boot System &amp; Butyl Seal Tape <a href="http://www.BuyPlasticNow.com">www.BuyPlasticNow.com</a> OR Similar</td>
<td>Order enough quantity to seal penetrations joints to the Vapor Block System</td>
</tr>
<tr>
<td>☐ Vapor barrier protection</td>
<td></td>
<td>Vapor Barrier System must be protected from penetrations during construction</td>
</tr>
<tr>
<td>☐ Additional undercoating sealant</td>
<td>Car undercoating</td>
<td>Undercoating can be applied to the vapor barrier penetrations at areas difficult to address with tape (Check with other project certification requirements and restrictions to assure this is acceptable material)</td>
</tr>
<tr>
<td>☐ Wrap vapor barrier over J</td>
<td></td>
<td>Remove after pour and cover holes w/ tape</td>
</tr>
<tr>
<td>☐ Multiple penetrations</td>
<td></td>
<td>1. Grouped penetrations are not recommended 2. May need &quot;pitch pocket&quot; strategy for grouped penetrations</td>
</tr>
</tbody>
</table>

### Basement Foundation

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-in-place</td>
<td></td>
<td>Refer to applicable details, photos and drawings</td>
</tr>
<tr>
<td>☐ Slab/wall intersection</td>
<td>SIGA Dockskin primer, Wigluv tape. Vapor bond tape. Prosoco Joint &amp; Seam</td>
<td>Location of bearing, detail, sub slab insulation, vapor barrier detail</td>
</tr>
<tr>
<td>☐ Wall penetrations</td>
<td>Location, details</td>
<td></td>
</tr>
<tr>
<td>☐ Build SMART Precast Walls</td>
<td></td>
<td>Location of bearing, detail, sub slab insulation, VB detail, construction sequence</td>
</tr>
<tr>
<td>☐ Slab/wall intersection</td>
<td></td>
<td>ALL underslab vapor Barrier is to be terminated and Sealed to the Interior of The Build SMART foundation wall systems, then the vertical joints are to be sealed to the top of the foundation wall and terminated at the underside of the floor framing system sill plate gasketing</td>
</tr>
<tr>
<td>☐ Vapor barrier connection slab/wall at all vertical joints at wall</td>
<td>SIGA Dockskin primer, wigluv tape.</td>
<td>ALL underslab vapor Barrier is to be terminated and Sealed to the Interior of The Build SMART foundation wall systems, then the vertical joints are to be sealed to the top of the foundation wall and terminated at the underside of the floor framing system sill plate gasketing</td>
</tr>
<tr>
<td>☐ Termination sealing of Vertical Build SMART Foundation Seams to top of foundation using Floor System Sill Gasketing</td>
<td><a href="http://www.conservationtechnology.com/">http://www.conservationtechnology.com/</a></td>
<td></td>
</tr>
</tbody>
</table>

### Build SMART Wall & Roof

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame walls on slab</td>
<td>Install pressure treated bottom plate that is ripped equal in width to the full width of the exterior framed wall studs and exterior OSB sheathing Sealant: Prosoco Joint and Seam</td>
<td>1. Install sealant on slab 2. Wrap under slab poly air barrier over sealant 3. Install sealant on poly air barrier 4. Install pressure treated bottom plates with exterior OSB rip on poly 5. Ensure plates are square and level 6. Install bottom plates installed in seamless manner</td>
</tr>
<tr>
<td>Frame walls on wood</td>
<td>Install structural insulated band @ the exterior perimeter of floor system Sealant: Prosoco Joint and Seam</td>
<td>1. Install sealant on top of basement wall/insulated band intersection 2. Install construction adhesive on top and bottom ribbon boards 3. Screw insulated band from interior as per engineering details</td>
</tr>
<tr>
<td>☐ Install vertical sealant at band panel to band panel</td>
<td>Prosoco Joint and Seam</td>
<td></td>
</tr>
<tr>
<td>PHASE</td>
<td>ITEM</td>
<td>PRODUCT (if applicable)</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hand Framed Wall &amp; Roof</td>
<td>Frame walls with ZIP wall air</td>
<td>Conservation Technology <a href="http://www.conservationtechnology.com/">http://www.conservationtechnology.com/</a></td>
</tr>
<tr>
<td></td>
<td>Bottom plate gasketing</td>
<td>Huber ZIP wall, Prosoco coatings</td>
</tr>
<tr>
<td></td>
<td>Verify if glued ZIP wall or sheathing is required</td>
<td>Wigluv &amp; Dockskin Primer (<a href="http://www.smallplanetworkshop.com">www.smallplanetworkshop.com</a>) or Vapor Barrier Butyl Tape (<a href="http://www.buyplasticnow.com">www.buyplasticnow.com</a>)</td>
</tr>
<tr>
<td></td>
<td>Be sure all exterior sheathing is complete from bottom of wall</td>
<td>ZIP tape with squeegee at ZIP wall. Alternates include Prosoco coatings, tape on OSB with primer (refer to assembly plan callouts)</td>
</tr>
<tr>
<td></td>
<td>Be sure all exterior sheathing tape is applied at all wall air barrier</td>
<td>ZIP tape with squeegee at ZIP wall. Alternates include Prosoco coatings, tape on OSB with primer (refer to assembly plan callouts)</td>
</tr>
<tr>
<td></td>
<td>Slab vapor barrier to ZIP wall</td>
<td>Dockskin primer, Wigluv tape, Prosoco Joint and Seam or ZIP Seals</td>
</tr>
</tbody>
</table>

**Relevant Notes:****
- **inspect** wall panel foam to foam for gaps. Apply spray foam to gaps of 1/8" or greater
- **seal** WRB zip sheathing with tape or liquid sealant
- **Top plate ZIP cap extension**
- **Top plate ZIP cap extension**
- **Top plate ZIP cap extension**
- **Top plate ZIP cap extension**
- **Top plate ZIP cap extension**
- **Application & sealing of OSB or ZIP to ceiling**
- **Bottom plate penetrations**

**Special Instructions:**
- **Inspect from top of panels once all panels are set**
- **Mark face of panels that have gaps of 1/8" or greater**
- **Drill series of holes large enough to accept spray foam nozzle starting at 3" from bottom of panel and the 16" OC to top**
- **Work from bottom hole to top and insert spray foam nozzle and insert foam to be sure it fills the entire seam. Work spray nozzle to interior of panel and pull out as foam fills**
- **Inspect all vapor barrier & repair any breaches & holes**

---

**Prooco Joint and Seam**

1. Sealant must be continuous & even bead
2. Apply horizontal sealant 2" longer than wall length
3. Sealant must be continuous & even bead
4. Apply vertical sealant complete to entire top to bottom
5. Install screws starting at within 3" from bottom of top plate and within 3" from top of bottom plate and then 2'-0" OC
6. Inspect from top of panels once all panels are set
7. Mark face of panels that have gaps of 1/8" or greater
8. Drill series of holes large enough to accept spray foam nozzle starting at 3" from bottom of panel and the 16" OC to top
9. Work from bottom hole to top and insert spray foam nozzle and insert foam to be sure it fills the entire seam. Work spray nozzle to interior of panel and pull out as foam fills
10. Inspect that all seams are taped & tape is not wrinkled or breached
11. Be sure all fasteners are sealed
12. Be sure ZIP cap is continuously sealed with tape or liquid sealant
13. Do not forget to seal bottom of butt joints between OSB cap extension
14. After trusses are set be sure that the seal is not breached and repair any breaches
15. OSB or ZIP applied to bottom chords of trusses with screws, be sure all screws go into chords
16. All seams need sealing with OSB or ZIP compatible TAPE & primer or liquid sealant
17. All fasteners must be sealed
18. Inspect all anchor bolts and other bottom plate penetrations are sealed
19. Be sure vapor barrier and ZIP wall are taped & sealed together both at the seam of tape/ZIP wall prior to folding up the ZIP wall and after the vapor barrier is lapped up to the ZIP wall
20. Be sure vapor barrier and ZIP wall are taped & sealed together both at the seam of tape/ZIP wall prior to folding up the ZIP wall and after the vapor barrier is lapped up to the ZIP wall

---

**Reference:**
- Conservation Technology http://www.conservationtechnology.com/
- Wigluv & Dockskin Primer (www.smallplanetworkshop.com) or Vapor Barrier Butyl Tape (www.buyplasticnow.com)
☐ Wall seam & wall fastener inspection

☐ Top plate ZIP cap extension

☐ Top plate ZIP cap extension taping

☐ Top plate ZIP cap extension taping inspection after truss setting

☐ Application & sealing of OSB to ceiling

☐ Bottom Plate Penetrations

☐ Frame walls – exterior insulation

☐ Install vinyl termite shield

☐ Min ½" lift @ window sills

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window &amp; Door Installation</td>
<td></td>
<td>Refer to applicable details, photos and drawings</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHASE</th>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window &amp; Door Installation</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
### Inspections

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ PH inspection of slab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Under slab insulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Under slab vapor barrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Wall/ceiling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Slab vapor barrier to wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Panel seam &amp; fastener</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Top plate &quot;LID&quot; Extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Bottom plate penetrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Ceiling seam &amp; fastener</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ MEP rough-in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Wall penetrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Ceiling penetrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ PHIUS+</td>
<td>REFER TO ALL PHIUS+ Checklists</td>
<td></td>
</tr>
<tr>
<td>☐ Pre-pour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Insulation</td>
<td>Thermal Imaging</td>
<td>PHIUS will require minimum 18 degree Delta heated minimum of 24 hours at insulation inspection</td>
</tr>
<tr>
<td>☐ Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Energy Star</td>
<td>REFER TO ALL ENERGY STAR Checklists</td>
<td></td>
</tr>
<tr>
<td>☐ Grade 1 batt insulation</td>
<td>Mn grade 2 batts required</td>
<td></td>
</tr>
</tbody>
</table>

### Air Testing Method

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PRODUCT (if applicable)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ First air test after panel</td>
<td></td>
<td>Prior to any exterior insulation installed</td>
</tr>
<tr>
<td>☐ Target benchmark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ &lt; 10,000 CF</td>
<td>0.45 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ 10,000 – 20,000 CF</td>
<td>0.40 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ 20,000 – 30,000 CF</td>
<td>0.35 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ &gt; 40,000 CF</td>
<td>0.30 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ Second air test after MEP rough-in</td>
<td></td>
<td>Prior to any interior or exterior insulation installed</td>
</tr>
<tr>
<td>☐ Target benchmark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ &lt; 10,000 CF</td>
<td>0.60 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ 10,000 – 20,000 CF</td>
<td>0.55 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ 20,000 – 30,000 CF</td>
<td>0.50 $ACH_{50}$</td>
<td></td>
</tr>
<tr>
<td>☐ &gt; 40,000 CF</td>
<td>0.45 $ACH_{50}$</td>
<td></td>
</tr>
</tbody>
</table>
### Field Carpentry Crew needs to be equipped with standard compliment of wood wall framing tools-Power and Hand

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Supplied By</th>
<th>Confirmed Delivered to site by</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety and MSDS Program, Training and Equipment</td>
<td></td>
<td>Builder</td>
<td></td>
<td>Specific to Project, implemented by Builder</td>
</tr>
<tr>
<td>16D Nails-Hand Nails</td>
<td>25 #</td>
<td>Builder</td>
<td></td>
<td>16D, 8D type per Carpenter’s equipment</td>
</tr>
<tr>
<td>8D Nails</td>
<td>25#</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gun Nails</td>
<td></td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20oz. Sausage Tube Gun(s)</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20oz. Cordless Sausage Tube Gun(s)</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>20oz. Standard Large Tube Caulk Gun(s)</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20oz. Cordless Standard caulking Gun(s)</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>Extra Sausage Gun Tips</td>
<td>Builder</td>
<td>Provider</td>
<td></td>
<td>Provided by Build Smart</td>
</tr>
<tr>
<td>Build Smart Sealant</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Assorted Sizes including 8’ sling</td>
</tr>
<tr>
<td>Huber Zip Tape or Huber Fluid Applied Sealant</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Enough for Zip Wall Seams on Panels, per manufacturer’s instructions</td>
</tr>
<tr>
<td>Titebond Polyurethane Glue Boz. Bottles</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Moisture Cured Polyurethane Glue</td>
</tr>
<tr>
<td>Water Spray bottle</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td>For Moistening Moisture Cured Products</td>
</tr>
<tr>
<td>Case of 12 Large Tube Construction Adhesive Rags</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Band Adhesive</td>
</tr>
<tr>
<td>Long Jabber for Cleaning out Sausage Gun Tips</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spray Foam &amp; Foam Gun</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting Straps</td>
<td>4</td>
<td>Builder</td>
<td></td>
<td>The following or similar, for panel lifting plate: Upgear Temporary Fall Protection Model#A210402 (5000lb capacity), can be obtained at Home Depot</td>
</tr>
<tr>
<td>#10 x 2-1/2” Hex Head Wood Screws</td>
<td>50</td>
<td>Builder</td>
<td></td>
<td>For Extra Lifting Plate Screws</td>
</tr>
<tr>
<td>Pressure Treated Sill Plates</td>
<td>Per Builder</td>
<td>Builder</td>
<td></td>
<td>Screwed boards (if using J-forms). Ripped to total width of wall panel bottom plate and stud wall sheathing thickness</td>
</tr>
<tr>
<td>Wall Top Plates</td>
<td>Per Builder</td>
<td>Builder</td>
<td>Project Wall Plate Width</td>
<td>Per Wood Floor Truss Manufacturer</td>
</tr>
<tr>
<td>Band or Ribbon Materials as required by Floor System Manufacturer</td>
<td>Per Builder</td>
<td>Builder</td>
<td>Per Project Wall Plate Width</td>
<td>Per Wood Floor Truss Manufacturer</td>
</tr>
<tr>
<td>Flashing at Panel to Basement Wall</td>
<td>Per Builder</td>
<td>Builder</td>
<td>Field Bent Aluminum Metal Flashing Per Build Smart Detail at Build Smart Panel Band to Precast Basement, dimensions per specific project OR PROSOCO FastFlash applied to complete underside of Wall Panel or Band Panel ZIP/ EPS / OSB</td>
<td></td>
</tr>
<tr>
<td>Dryvit Rasp</td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Bars</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digging Bar</td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crow Bars</td>
<td>2</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6” C-Clamps</td>
<td>2</td>
<td>Builder</td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
<td></td>
</tr>
<tr>
<td>8” C-Clamps</td>
<td>2</td>
<td>Builder</td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
<td></td>
</tr>
<tr>
<td>12” C-Clamps</td>
<td>2</td>
<td>Builder</td>
<td>Build Smart will have this when they are on site, recommend Builder has when Build Smart is not on site</td>
<td></td>
</tr>
<tr>
<td>Build SMART Clamoing Tool</td>
<td>Consult with Build SMART for details</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ladder-6’</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ladder-8’</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step Ladder-10’</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 legged ladder</td>
<td>Optional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Protection Program, Training and Equipment</td>
<td>2</td>
<td>Builder</td>
<td>Cordless Preferred</td>
<td>Specific to Project, implemented by Builder</td>
</tr>
<tr>
<td>Hammer Drill</td>
<td>1</td>
<td>Builder</td>
<td>For Drilling Tacons</td>
<td></td>
</tr>
<tr>
<td>Cordless Drill Driver &amp; Assorted Bits</td>
<td>1</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item Description</td>
<td>Quantity</td>
<td>Supplied By</td>
<td>Confirmed Delivered to site by</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>-------------</td>
<td>--------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>GRK &quot;R4-10x2-3/4&quot; or Similar</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Will Be used Panel to Panel and Second Floor Sill Plates to Wood Floor System. Enough for Each Bottom Plate and end of panels and 2'-0&quot; OC and enough for vertical Panel to Panel Seams-adjacent to top and bottom plate and then 2'-0&quot; OC.</td>
</tr>
<tr>
<td>Bits for GRK or Panel Screws</td>
<td>10</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tapcons - 1/4&quot; x 3&quot; Hex</td>
<td>Builder</td>
<td></td>
<td></td>
<td>For PT Sill Plates into concrete slab, confirm and specify type and spacing per local code official and requirements.</td>
</tr>
<tr>
<td>Drill Bits and Driver for setting Tapcons</td>
<td>1 Set</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/16&quot; x 4-1/2&quot; Tapcon or Masonry Bits</td>
<td>N/A</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/16&quot; Hex Impact Hex Bits for setting Tapcons</td>
<td>N/A</td>
<td>Builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9 x2-1/2&quot; Wood Screws</td>
<td>Builder</td>
<td></td>
<td></td>
<td>For Securing Build Smart Floor System Bands, Perpendicular to Trusses.</td>
</tr>
<tr>
<td>#9 x3&quot; Wood Screws</td>
<td>Builder</td>
<td></td>
<td></td>
<td>For Securing Build Smart Floor System Bands, Parallel to Floor Trusses &amp; Perpendicular Roof Trusses.</td>
</tr>
<tr>
<td>Wedge Anchors/ Thunderstuds</td>
<td>Builder</td>
<td></td>
<td></td>
<td>For Final PT Sill Plate Setting into Concrete Slab, FINAL SIZING QUANTITY AND SPACING TO BE DETERMINED BY Builder, Depth Requirement Per Project Specific Assembly and Local Code Requirements.</td>
</tr>
<tr>
<td>Wedge Anchors/ Thunderstuds Drill Bit</td>
<td>Builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simpson &quot;SWDC truss screw&quot;</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Need Two per each end of roof truss.</td>
</tr>
<tr>
<td><strong>Concrete Slab /Vapor Barrier:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Block Tape</td>
<td></td>
<td></td>
<td>Enough for Vapor Block Vapor Barrier Seams and Vapor Boots.</td>
<td></td>
</tr>
<tr>
<td>Vapor Block Boots</td>
<td></td>
<td></td>
<td>Enough for Vapor Block Penetrations.</td>
<td></td>
</tr>
<tr>
<td>Automotive Undercoating</td>
<td>2 Cans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>J-Forms Prior to Walls:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dryvit Primus or Genesis (NEEDS TO BE COMPLETED at THE ENTIRE J-FORM FACE AND FILLER STRIP PRIOR TO ANY WALLS BEING INSTALLED)</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Enough to cover top of J-Form and perimeter face of exposed J-Form, per manufacturer coverage rate.</td>
</tr>
<tr>
<td>Dryvit Fiberglass Mesh (NEEDS TO BE COMPLETED at THE ENTIRE J-FORM FACE AND FILLER STRIP PRIOR TO ANY WALLS BEING INSTALLED)</td>
<td>Builder</td>
<td></td>
<td></td>
<td>Enough to cover top of J-Form and perimeter face of exposed J-Form.</td>
</tr>
</tbody>
</table>
c. Standard Details

Detail #1: Passiv Basement to Wood Floor System

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #2: Slab to Framed Floor

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #3: Slab

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #4: Wall to Roof

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #5: Walls to Wood Floor System

Insulation
Wall Finish
Build SMART Sealant
Floor system & finish
Build SMART Wall Panel System
"ZIP" System Seam Sealer
Build SMART Band System
Air Barrier - shown in blue
"ZIP" System Seam Sealer
Build SMART Wall Panel System

NOTE: MATERIALS NOTED AS "Build SMART"
ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM.
ALL OTHER MATERIALS ARE BY OTHERS.
Detail #6: Passiv Basement to Slab

Build SMART Precast Foundation

PT Blocking - 36" o.c. req. in areas w/ 48" or more of exterior backfill

Damproofing

Drainable fill

Air space

2x Framing, Insulation & Finish

Wigluv tape with dockside primer

Poly Air Barrier - shown in blue

Rebar tie - 48" o.c. +/- req. in areas with less than 18" of exterior backfill

4" Slotted Drain tile to daylight

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #7: Passiv Walkout Basement to Slab

Air space

Build SMART Precast Foundation

Wigluv tape with dockskin primer

Poly Air Barrier - shown in blue

Finish Grade

Varies

Rabar tie - 48" o.c. +/- req. in areas with less than 18" of exterior backfill

4" Slotted Drain tile to daylight

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #8: Passiv Basement Wall (Plan View)

Build SMART Precast Wall System

Air space

2x Framing, Insulation & Finish

NOTE: MATERIALS NOTED AS "Build SMART" ARE PART OF THE SUPPLIED PASSIVHAUS SYSTEM. ALL OTHER MATERIALS ARE BY OTHERS.
Detail #9a: Window Sill Install Detail – Fibercement
Detail #9b: Window Jamb Install Detail – Fibercement

- Window
- Sealant
- 2x2 blocking (Field Installed)
- 1x FC Return
- 1x4 FC trim
- 3/4" strapping
- Sealant
- FC Siding
- Rainscreen
- Wall Panel Assembly

1x jamb
Field applied EPS
Trim
3 1/2" Batt Insul
1/2" Gyp DW

1" 3" 5" 0" 2" 4" 6"
Detail #9c: Window Head Install Detail – Fibercement
Detail #10a: Window Sill Install Detail – Veneer Stone
Detail #11a: Door Installation Detail – Veneer Stone on Slab
Detail #12a: Window Sill Install Detail – EIFS

- Window Sealant
- Field applied EPS
- Break metal sill with end dams
- EIFS Finish
- EIFS Substrate
- Drainage Plane "Stucco Wrap" or eq
- Wall Panel Assembly
- 1 x sill
- Field applied EPS
- Apron
- 3 1/2" Batt Insul
- 1/2" Gyp DW

Slope

Scale: 1" = 36"
Detail #12b: Window Jamb Install Detail – EIFS

- Window
- Sealant
- EIFS Return
- EIFS Finish
- EIFS Substrate
- Drainage Plane
- "Stucco Wrap" or eq
- Wall Panel Assembly
- 1x jamb
- Field applied EPS
- Trim
- 3 1/2" Batt Insul
- 1/2" Gyp DW

Scale: 1" = 3"
Detail #12c: Window Head Install Detail – EIFS

Wall Panel Assembly
1/2" Gyp DW
Trim
Field applied EPS
1x Head

Drainage Plane
"Stucco Wrap" or eq
EIFS Substrate
EIFS Finish
Drainage Plane
Material Wrap
Over Drainage
Track
Drainage Track or eq
EIFS Return
Sealant
Window
d. Product Data Sheets and Material Safety Data Sheets
**Product Data Sheet**

**R-Guard FastFlash®**

**TYPICAL TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORM</strong></td>
<td>Viscous paste, mild odor</td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY</strong></td>
<td>1.45 – 1.55</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>WT/GAL</strong></td>
<td>12.5 lbs</td>
</tr>
<tr>
<td><strong>TOTAL SOLIDS</strong></td>
<td>90%</td>
</tr>
<tr>
<td><strong>VOC CONTENT</strong></td>
<td>30 g/L maximum</td>
</tr>
<tr>
<td><strong>FLASH POINT</strong></td>
<td>&gt;200°F (&gt;93°C)</td>
</tr>
<tr>
<td><strong>FREEZE POINT</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>SHELF LIFE</strong></td>
<td>1 year in tightly sealed, unopened container</td>
</tr>
</tbody>
</table>

**Cured Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardness, Shore A</strong></td>
<td>35-45</td>
</tr>
<tr>
<td><strong>Tensile Strength</strong></td>
<td>&gt;150 psi</td>
</tr>
<tr>
<td><strong>Elongation at Break</strong></td>
<td>&gt;350%</td>
</tr>
<tr>
<td><strong>Water Vapor Transmission</strong></td>
<td>21 perms</td>
</tr>
<tr>
<td><strong>ASTM E 96</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Corrosive Properties</strong></td>
<td>Non-corrosive</td>
</tr>
<tr>
<td><strong>Transfer Free Time</strong></td>
<td>30-40 minutes</td>
</tr>
</tbody>
</table>

Refer to the R-Guard FastFlash® Product Test Results document for a complete list of performance test results.

**PREPARATION**

To ensure best results, apply to clean surfaces free of contaminants. Chemical residues, surface coatings or films may adversely affect adhesion. Pressure-treated wood and other contaminated surfaces should be cleaned with a solvent wipe before application.

Protect people, vehicles, property, plants and all other surfaces not intended to receive FastFlash®.

Remove and replace damaged sheathing.

In rough openings, prime all raw gypsum board edges with R-Guard PorousPrep.

Any gaps or joints greater than 1 inch should be structurally repaired or readied for an appropriate transition membrane.

Ensure positive drainage at all rough openings.

**Surface & Air Temperatures**

Surface and ambient temperatures should be 40°F (4°C) and rising and below 110°F (43°C) during application and drying. Wind and high temperatures will accelerate drying.

**Hot Weather Precautions:** If air or surface temperatures exceed 95°F (35°C), apply to shaded surfaces and before daytime air and surface temperatures reach their peak. Hot surfaces may be cooled with a mist of fresh water. Keep containers closed and out of direct sunlight when not in use.

**Cold Weather Conditions:** May be applied to frost-free substrates at temperatures below 32°F (0°C). Product will not start curing and drying until temperature rises to and remains above 32°F (0°C).

**Low Humidity Conditions:** Curing may take longer than 12 hours. Lightly misting treated surfaces with fresh water will accelerate curing. Uncured material may delay construction.

Though FastFlash® may be applied to damp surfaces and tolerates rain immediately after application, do not apply to surfaces with standing water or frost.

**Equipment**

Apply using a professional caulking gun. Use a DRY joint knife, trowel, or spatula to spread the product. Do not use scopy water when tooling or spreading.

**Storage & Handling**

Store in a cool, dry place. Keep container tightly closed when not dispensing. Do not open container until preparation work has been completed. Do not alter or mix with other chemicals. When stored at or below 80°F (27°C) R-Guard FastFlash® has a shelf life of 12 months after the date of manufacture. This shelf life assumes upright storage of factory-sealed containers. Do not double stack pallets. Dispose of unused product and container in accordance with local, state and federal regulations.
Product Data Sheet
R-Guard FastFlash®

APPLICATION
Read “Preparation” and the Safety Data Sheet before use.

Dilution & Mixing
Apply as packaged. Do not dilute or alter, or use for applications other than specified. No mixing required.

Typical Coverage Rates
Coverage varies based on surface texture and irregularities. R-Guard FastFlash® is sold in 29 oz tubes and 20 oz sausages.
• 22–28 sq.ft. per 29 oz tube applied at 12–15 mils
• 15–17 sq.ft. per 20 oz sausage applied at 12–15 mils

Application Instructions
PREPARE
Prepare all surfaces as described above under “Preparation.” Once preparation is complete, cut open tip of threaded fitting, install nozzle and cut nozzle to desired opening.

Filling Joints, Seams and Cracks
1. Apply a thick bead of FastFlash® to all sheathing joints, seams and cracks. Treat joints ranging from 1/4 to 1/2 inch with backer rod before applying FastFlash®. Alternatively, R-Guard Joint & Seam Filler may be used in place of backer rod. Joints ranging from 1/2 to 1 inch require backer rod and R-Guard Joint & Seam Filler. Joints greater than 1 inch must be structurally improved or addressed with an appropriate materials. On plywood, spot wood knots, deep cracks or surface irregularities.
2. Use a DRY joint knife, trowel or spatula to tool and spread the product. Spread 1-inch beyond seam at each side to a thickness of 12–15 mils.
3. Allow to skin before installing other waterproofing or air barrier components.

Waterproofing Rough Openings
1. Apply a bead of product in each corner of the rough opening. Apply additional product in a zigzag pattern over the exterior framing inside the rough opening. Spread the wet product to create an opaque, monolithic flashing membrane.
2. Apply a thick bead of FastFlash® in a zigzag pattern to the exterior wall surrounding the rough opening. Spread the product to create an opaque, monolithic flashing membrane at 12–15 mils which surrounds the rough opening and extends 4 to 6 inches (100–152 mm) over the face of exterior wall.

NOTE: When using with existing sheet weather resistive barriers, extend FastFlash® 8-10 inches over the face of the exterior wall to ensure positive drainage.
3. Allow treated surfaces to skin before installing windows, doors and other wall assembly, waterproofing or air barrier components.

PROTECT
Apply PROSOCO R-Guard® Spray Wrap MVP, VB, Cat 5® Cat 5® Rain Screen or other waterproofing or air barrier component pursuant to manufacturer instructions.

TRANSITION
Flashing Transitions
1. Apply a generous bead of FastFlash® to the top edge of R-Guard SS ThruWall or other flashing leg.
2. Spread the wet product to create a monolithic “cap flash” flashing membrane that extends 2 inches (51 mm) up the vertical face of the exterior wall and down over the fastener heads of the SS ThruWall Termination Bar. This “liquid termination bar” helps secure the flashing and ensures positive drainage from the wall surface to the flashing.

REPAIR
After applying R-Guard Spray Wrap MVP, Cat 5®, Cat 5® Rain Screen, VB or other waterproofing or air barrier component, FastFlash® may be used to fill any cracks or voids to achieve a seamless, pinhole and void free coating.

Curing & Drying
At 70°F (21°C) and 50% relative humidity, product skins within 30 minutes and dries in 4 hours.

FastFlash® is moisture curing. Low temperatures and low relative humidity slow dry time. High temperatures and high relative humidity accelerates dry time.

Cleanup
Clean tools and equipment with mineral spirits or similar solvent immediately after use. Follow all safety precautions. Remove cured FastFlash® mechanically using a sharp-edged tool.
PRODUCT DATA SHEET
R-Guard FastFlash

WARRANTY
The information and recommendations made are
based on our own research and the research of
others, and are believed to be accurate. However,
no guarantee of their accuracy is made because
we cannot cover every possible application of
our products, nor anticipate every variation
encountered in masonry surfaces, job conditions
and methods used. The purchasers shall make
their own tests to determine the suitability of such
products for a particular purpose.

PROSOCO, Inc. warrants this product to be free
from defects. Where permitted by law, PROSOCO
makes no other warranties with respect to
this product, express or implied, including
without limitation the implied warranties of
merchantability or fitness for particular purpose.
The purchaser shall be responsible to make his own
tests to determine the suitability of this product for
his particular purpose. PROSOCO’s liability shall be
limited in all events to supplying sufficient product
to re-treat the specific areas to which defective
product has been applied. Acceptance and use of
this product abases PROSOCO from any other
liability, from whatever source, including liability
for incidental, consequential or resultant damages
whether due to breach of warranty, negligence or
strict liability. This warranty may not be modified
or extended by representatives of PROSOCO, its
distributors or dealers.

CUSTOMER CARE
Factory personnel are available for product,
environment and job-safety assistance with no
obligation. Call 800-255-4255 and ask for Customer
Care – technical support.

Factory-trained representatives are established in
principal cities throughout the continental United
States. Call Customer Care at 800-255-4255, or visit
our web site at www.prosoco.com, for the name of
the PROSOCO representative in your area.

BEST PRACTICES
Surfaces should be clean, free of standing water
and in good repair before application. Most
building surfaces can be cleaned using Enviro
Klean’s 2010 All Surface Cleaner. Information is
available by calling Customer Care at 800-255-
4255.

In rough openings, prime raw gypsum board
edges with R-Guard PorousPrep.
For best results, spread tool FastFlash® while
still wet, within 2-3 minutes of gun application.

Hot Weather Precautions: If air or surface
temperatures exceed 90°F (35°C), apply to
shaded surfaces and before daytime air and
surface temperatures reach their peak. Hot
surfaces may be cooled with a mist of fresh
water. Keep containers closed and out of
direct sunlight when not in use. Cold Weather
Conditions: May be applied to frost-free
substrates at temperatures below 32°F (0°C).
Product will not start curing and drying
until temperature rises to and remains above
32°F (0°C). Low Humidity Conditions: Curing
may take longer than 12 hours. LIGHTLY
mixing treated surfaces with fresh water will
accelerate curing. Unsealed material may delay
curing.

FastFlash® may be used to adhere and gasket
mechanically fastened building components.
When using FastFlash® as a flashing
membrane, apply 12-15 wet mils. FastFlash®
produces an opaque flashing membrane when
installed at the recommended 12-15 wet mils to
simplify inspection and quality control.

PROSOCO R-Guard® Joint & Seam Filler,
FastFlash® and AirDam® are recommended for
improved performance of all R-Guard air- and
water-resistant barrier coatings.

Allow FastFlash® to skin over before installing
the selected PROSOCO R-Guard® Primary Air &
Water-Resistive Barrier.

Use FastFlash® after the primary R-Guard air
barrier has been applied to repair cracks or fill
voids.

Illustration depicting the use of PROSOCO
R-Guard® products are available at www.
prosoco.com by downloading the R-Guard
Installation Guidelines.

To schedule field technical support, contact
your PROSOCO Technical Customer Care
Toll-free at 800-255-4255. Field visits by
PROSOCO personnel are for the purpose of
making technical recommendations only.
PROSOCO is not responsible for providing
job site supervision or quality control.
Proper application is the responsibility of the
applicator.
### PRODUCT TEST RESULTS
**R-Guard FastFlash®**

**AAMA 714-12: VOLUNTARY SPECIFICATION FOR LIQUID-APPLIED FLASHING USED TO CREATE A WATER-RESISTIVE SEAL AROUND EXTERIOR WALL OPENINGS IN BUILDINGS**

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive Strength to Substrates</td>
<td>ASTM C 794</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Penetration Around Nails</td>
<td>Modified ASTM D 1670; AAMA 711 Section 5.3</td>
<td>Shall pass 31 mm (1.2 in) of water</td>
<td>Pass</td>
</tr>
<tr>
<td>Accelerated UV Aging</td>
<td>ASTM C 155, UVA cycle 1; ASTM C 794, Visual</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
<tr>
<td>Elevated Temperature Exposure, Level 3=176°F for 7 days</td>
<td>AAMA 711 ASTM C 794</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
<tr>
<td>Thermal Cycling (10 cycles) Peel Adhesion</td>
<td>AAMA 711 ASTM C 794</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
<tr>
<td>Crack Bridging</td>
<td>ASTM C 1305</td>
<td>Water holdout of 550 millimeters for 24 hours with 1/8 inch crack after cycling per ASTM C 1305 for 10 cycles.</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Immersion</td>
<td>AAMA 711 ASTM C 794</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Vapor Permeability</td>
<td>ASTM H 06 Wet Cup</td>
<td>Minimum of 10 perms at manufacturer’s recommended application thickness</td>
<td>Pass – 31 perms</td>
</tr>
<tr>
<td>Damp Surfaces</td>
<td>ASTM C 794</td>
<td>≥ 5 pli</td>
<td>Pass</td>
</tr>
</tbody>
</table>

**ICC-ES AC212: ACCEPTANCE CRITERIA FOR WATER-RESISTIVE COATINGS USED AS WATER-RESISTIVE BARRIERS OVER EXTERIOR SHEATHING (“FASTFLASH TESTED AS PART OF AN ASSEMBLY”)**

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Bond</td>
<td>ASTM C 207</td>
<td>Minimum 15 psi (100 kPa)</td>
<td>Pass</td>
</tr>
<tr>
<td>Freeze-Thaw</td>
<td>ICC-ES AC212</td>
<td>No cracking, checking, crazing, erosion, delamination or other deleterious effects</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>ASTM D 2247</td>
<td>No cracking, checking, crazing, erosion, delamination or other deleterious effects</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Penetration</td>
<td>ASTM H 391</td>
<td>No visible water penetration at sheathing joints as viewed from back of the panel</td>
<td>Pass</td>
</tr>
<tr>
<td>Weathering</td>
<td>ICC-ES AC212 ASTM 1397</td>
<td>No cracking of the coating; no water penetration</td>
<td>Pass</td>
</tr>
</tbody>
</table>

**ABAA: AIR BARRIER ASSOCIATION OF AMERICA ACCEPTANCE CRITERIA FOR LIQUID APPLIED MEMBRANES (“FASTFLASH TESTED AS PART OF AN ASSEMBLY”)**

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Leakage of Air Barrier Assemblies</td>
<td>ASTM H 3297</td>
<td>≤ 0.2 L/s·m² at 75 Pa (0.04 cfm/ft² at 1.27 psf)</td>
<td>Pass: 0.0105 L/s·m² at 75 Pa (0.00241 cfm/ft² at 1.27 psf)</td>
</tr>
</tbody>
</table>

**FIRE TESTING**

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Burning Characteristics</td>
<td>ASTM H 84</td>
<td>Criteria for IIC and NFPA Class A Building Material: Flame Spread ≤ 25 Smoke Developed ≤ 450</td>
<td>Meets Class A Building Material Flame Spread: 15 Smoke Developed: 10</td>
</tr>
</tbody>
</table>

All testing was completed by independent, accredited laboratories.

**NOTES:**
1. International Code Council Evaluation Service Acceptance Criteria 212
2. American Association of Textile Chemists and Colorists

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Product Test Data • Page 1 of 1 • Item #70400 – 020916 • ©2016 PROSOCO, Inc. • www.prosoco.com
### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Identifier**
- **Product Name:** PROSOCO R-Guard® FastFlash®

**Other means of identification**
- **Product Code:** 70400

**Recommended use of the chemical and restrictions on use**
- **Recommended Use:** Restricted to professional users.
- **Uses advised against:** No information available

**Details of the supplier of the safety data sheet**
- **Manufacturer Address:**
  - **PROSOCO, Inc.**
  - **3741 Greenway Circle**
  - **Lawrence, Kansas 66046**
- **Emergency telephone number**
  - **8:00 AM – 5:00 PM CST Monday-Friday:** 785-865-4200
  - **NON-BUSINESS HOURS (INFOTRAC):** 800-535-5053

### 2. HAZARDS IDENTIFICATION

**Classification**

| Reproductive toxicity | Category 1B |

**Label elements**

**Emergency Overview**

**Danger**

**Hazard statements**
- May damage fertility or the unborn child

**Appearance** paste  
**Physical state** Paste/Gel Liquid  
**Odor** Mild

**Precautionary Statements - Prevention**
- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required

**Precautionary Statements - Response**
- IF exposed or concerned: Get medical advice/attention
Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Other Information
No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary - Silly Terminated Polyether</td>
<td>Undisclosed</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Limestone</td>
<td>1317-65-3</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Precipitated Calcium Carbonate</td>
<td>471-34-1</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Polypropylene glycol</td>
<td>25322-69-4</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Aminoethyl aminopropy trimethoxy silane</td>
<td>1760-24-3</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Hydrophobic Silica</td>
<td>67762-90-7</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Dibutyltin Diacetylldiacetonate</td>
<td>22673-19-4</td>
<td>0.1 - 1</td>
<td>*</td>
</tr>
</tbody>
</table>

* The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures

General advice
If symptoms persist, call a physician. Do not get in eyes, on skin, or on clothing.

Eye contact
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. If symptoms persist, call a physician.

Skin Contact
Wipe off material with a dry cloth. Wash with soap and water. Consult a physician if necessary.

Inhalation
Remove to fresh air. If symptoms persist, call a physician.

Ingestion
Do NOT induce vomiting. Drink plenty of water. Rinse mouth. If symptoms persist, call a physician.

Self-protection of the first aider
Use personal protective equipment as required.

Most important symptoms and effects, both acute and delayed

Symptoms
May cause irritation. May be harmful if swallowed.

Indication of any immediate medical attention and special treatment needed

Note to physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with skin, eyes or clothing. Avoid breathing vapors or mists.

Environmental precautions
Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.

Incompatible materials
Acids. Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone 1317-05-3</td>
<td>-</td>
<td>TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction (vacated) TWA: 15 mg/m³ total dust (vacated) TWA: 5 mg/m³ respirable fraction</td>
</tr>
<tr>
<td>Precipitated Calcium Carbonate 471-34-1</td>
<td>-</td>
<td>TWA: 10 mg/m³ total dust TWA: 5 mg/m³ respirable dust</td>
</tr>
<tr>
<td>Dibutyltin Diacetyletacetate 22073-19-4</td>
<td>STEL: 0.2 mg/m³ Sn TWA: 0.1 mg/m³ Sn (vacated) TWA: 0.1 mg/m³ Sn</td>
<td>TWA: 0.1 mg/m³ Sn TWA: 0.1 mg/m³ except</td>
</tr>
</tbody>
</table>

Page 3/7
NIOSH TLV: Immediately Dangerous to Life or Health

Other Information: Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls:

Engineering Controls: None under normal use conditions.

Individual protection measures, such as personal protective equipment:

- **Eye/face protection**: Wear safety glasses with side shields (or goggles).
- **Skin and body protection**: Wear protective gloves and protective clothing.
- **Respiratory protection**: If exposure limits are exceeded or irritation is experienced, NIOSH/MISHA approved respiratory protection should be worn. Positive pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations: Avoid contact with eyes, skin, and clothing. Wash contaminated clothing before reuse. Use personal protective equipment as required.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks + Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Paste/Gel Liquid</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>paste</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>red</td>
<td>Odor threshold</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Boiling point/bolling range</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 100 °C / &gt; 212 °F</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.45 - 1.60</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>Insoluble</td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Kinematic viscosity</td>
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<td></td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>No information available</td>
<td></td>
</tr>
</tbody>
</table>

## 10. STABILITY AND REACTIVITY

**Reactivity**: No data available

**Chemical stability**: 

Page 4/7
11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation
May be harmful by inhalation, ingestion, or skin absorption

Avoid breathing vapors or mists.

Eye contact
Avoid contact with eyes.

Skin Contact
Avoid contact with skin.

Ingestion
Do not taste or swallow.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitated Calcium Carbonate</td>
<td>= 6450 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>471-34-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polypropylene glycol</td>
<td>&gt; 2 g/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>25322-68-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stearic acid</td>
<td>-</td>
<td>&gt; 5 g/kg (Rabbit)</td>
<td>-</td>
</tr>
<tr>
<td>57-11-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aminomethyl aminopropyl trimethoxy</td>
<td>= 7460 μL/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>silane 1760-24-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
May cause irritation. May be harmful if swallowed.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Reproductive toxicity
May damage fertility or the unborn child.

STOT - single exposure
No information available.

STOT - repeated exposure
No information available.

Aspiration hazard
No information available.

Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document.

ATEmix (oral) 5815 mg/kg
ATEmix (dermal) 19017 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity
Persistence and degradability
No information available.

Bioaccumulation
No information available.

Other adverse effects
No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
Do not reuse container.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT
Not Regulated for all modes of transportation.

15. REGULATORY INFORMATION

International Inventories

TSCA
Complies

DSL/NDSL
Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory Complies
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard
Yes

Chronic Health Hazard
No

Fire hazard
No

Sudden release of pressure hazard
No

Reactive Hazard
No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)
CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz - 14808-60-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>Methanol - 67-56-1</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>1317-65-3</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>14088-60-2</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bis (2-ethylhexyl) adipate</td>
<td>X 103-23-1</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

NFPA

<table>
<thead>
<tr>
<th>Health hazards</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical and Chemical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

HMIS

<table>
<thead>
<tr>
<th>Health hazards</th>
<th>Flammability</th>
<th>Physical hazards</th>
<th>Personal protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>

Prepared By
Regulatory Department

Issue Date
26-Aug-2014

Revision Date
28-Jan-2016

Revision Note
SOS sections updated
2.4.6.8.11

Disclaimer
The information contained on the Safety Data Sheet has been compiled from data considered accurate. This data is believed to be reliable, but it must be pointed out that values for certain properties are known to vary from source to source. PROSOCO, Inc. expressly disclaims any warranty express or implied as well as any liability for any injury or loss arising from the use of this information or the materials described. This data is not to be construed as absolutely complete since additional data may be desirable when particular conditions or circumstances exist. It is the responsibility of the user to determine the best precautions necessary for the safe handling and use of this product for his unique application. This data relates only to the specific material designated and is not to be used in combination with any other material. Many federal and state regulations pertain directly or indirectly to the product's end use and disposal of containers and unused material. It is the purchaser's responsibility to familiarize himself with all applicable regulations.

End of Safety Data Sheet
PROSOCO R-Guard® Joint & Seam Filler is a gun-grade, crack and joint filler, adhesive and detailing compound that combines the best of silicone and polyurethane properties. This single-component, fiber-reinforced, Silly-Terminated-Poly-Ether (STPE) is easy to gun, spread and tool.

Use Joint & Seam Filler to fill openings and create transitions where flexible reinforcement is required to bridge larger gaps and provide continuous support of fluid-applied flashing membranes, waterproofing or air barrier components.

Suitable for all climates, Joint & Seam Filler bonds directly to damp or dry surfaces and cures under a variety of weather conditions. It dramatically reduces surface preparation time by eliminating the need for reinforcing tapes at sheathing joints, inside and outside corners.

Use Joint & Seam Filler as part of a continuous, building-wide air barrier system, or to prepare surfaces for conventional waterproofing or air barrier components. Joint & Seam Filler may also be used to repair cracks or fill voids after the primary R-Guard air barrier has been applied.

ADVANTAGES

- Streamlines preparation by eliminating the need for joint reinforcing tapes.
- Silane functional polymer provides superior long-term adhesion, crack filling and weathering characteristics.
- Bonds to most common building materials without priming.
- Single component saves time – no mixing.
- Fills open joints and seams up to 1 inch in width.
- Bonds and cures in wet weather and on damp substrates. Tolerates rain immediately after application.
- May be fully exposed to UV and weather for up to 12 months. If longer, contact for inspection.
- Compatible with most sealants and waterproofing or air barrier components.
- Solvent free. Isocyanate free. Phthalate free.
- No shrinkage. No staining. No yellowing.
- Breathable – allows damp surfaces to dry.
- Will not support mold growth.
- Service temperatures from −75°F to 300°F (−59°C to 149°C).
- Illustration depicting the use of PROSOCO R-Guard® products are available at www.prosoco.com by downloading the R-Guard Installation Guidelines.

Limitations

- Not for use as a liquid flashing membrane. Use R-Guard FastFlash®.
- Not for use in place of appropriate through-wall flashing. See R-Guard SS ThruWall product literature.
- Not for use below grade or in locations which are continuously immersed in water.

REGULATORY COMPLIANCE

VOC Compliance

R-Guard Joint & Seam Filler is compliant with the following national, state and district VOC regulations:

X US Environmental Protection Agency
X California Air Resources Board SCM Districts
X South Coast Air Quality Management District
X Maricopa County, AZ
X Northeast Ozone Transport Commission

SAFETY INFORMATION

Always read full label and SDS for precautionary instructions before use. Use appropriate safety equipment and job site controls during application and handling.

24-Hour Emergency Information:
INFOTRAC at 800-535-5053
**Product Data Sheet**
**R-Guard Joint & Seam Filler**

### TYPICAL TECHNICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORM</strong></td>
<td>Viscous paste, mild odor, pale red color</td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY</strong></td>
<td>1.40 – 1.50</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>WT/GAL</strong></td>
<td>11.8 lbs</td>
</tr>
<tr>
<td><strong>TOTAL SOLIDS</strong></td>
<td>99%</td>
</tr>
<tr>
<td><strong>VOC CONTENT</strong></td>
<td>30 g/L maximum</td>
</tr>
<tr>
<td><strong>FLASH POINT</strong></td>
<td>No date</td>
</tr>
<tr>
<td><strong>FREEZE POINT</strong></td>
<td>No data</td>
</tr>
<tr>
<td><strong>SHELF LIFE</strong></td>
<td>1 year in tightly sealed, unopened container</td>
</tr>
</tbody>
</table>

### Cured Properties

- **Hardness, Shore A**: 40-50
- **Tensile Strength**: 70 psi
- **Elongation at Break**: 180%
- **Water Vapor Transmission**: 15 perms @ 20 mils
- **Peel Strength**: >25 pli
- **Accelerated Weathering**: Pass
- **Shrinkage**: None
- **Corrosive Properties**: Non-corrosive

### Uncured Properties

- **Cure Rate**: 1/8 inch thickness/24 hours
- **Tack-Free Time**: 20-40 minutes

Refer to the R-Guard Joint & Seam Filler Product Test Results document for a complete list of performance test results.

### PREPARATION

To ensure best results, apply to clean surfaces free of contaminants. Chemical residues, surface coatings or films may adversely affect adhesion. Pressure-treated wood and other contaminated surfaces should be cleaned with a solvent wipe before application.

Protect people, vehicles, property, plants and all other surfaces not intended to receive Joint & Seam Filler.

Remove and replace damaged sheathing.

Any gaps or joints greater than 1 inch should be structurally repaired or readied for an appropriate transition membrane.

In rough openings, prime all raw gypsum board edges with R-Guard PorousPrep.

### Surface & Air Temperatures

Surface and ambient temperatures should be 40°F (4°C) and rising and below 110°F (43°C) during application and drying. Wind and high temperatures will accelerate drying.

**Hot Weather Precautions**: If air or surface temperatures exceed 95°F (35°C) apply to shaded surfaces and before daytime air and surface temperatures reach their peak. Hot surfaces may be cooled with a mist of fresh water. Keep containers closed and out of direct sunlight when not in use.

**Cold Weather Conditions**: May be applied to frost-free substrates at temperatures below 32°F (0°C). Product will not start curing and drying until temperature rises to and remains above 32°F (0°C).

**Low Humidity Conditions**: Curing may take longer than 12 hours. Lightly misting treated surfaces with fresh water will accelerate curing. Uncured material may delay construction.

Though Joint & Seam Filler may be applied to damp surfaces and tolerates rain immediately after application, do not apply to surfaces with standing water or frost.

### Equipment

Apply using a professional caulking gun. Use a DRY joint knife, trowel or spatula to tool and spread the product. Do not use soapy water when tooling or spreading.

### Storage & Handling

Store in a cool, dry place. Keep container tightly closed when not dispensing. Do not open container until preparation work has been completed. Do not allow or mix with other chemicals. When stored at or below 80°F (27°C) R-Guard Joint & Seam Filler has a shelf life of 12 months after the date of manufacture. This shelf life assumes upright storage of factory-sealed containers. Do not double stack pallets. Dispose of unused product and container in accordance with local, state and federal regulations.
Product Data Sheet
R-Guard Joint & Seam Filler

APPLICATION
Read “Preparation” and the Safety Data Sheet before use.

Dilution & Mixing
Apply as packaged. Do not dilute or alter, or use for applications other than specified. No mixing required.

Typical Coverage Rates
Coverage varies based on surface texture and irregularities. R-Guard Joint & Seam Filler is sold in 29-oz tubes and 20-oz sausages.

Estimated coverage includes overlapping 1-inch on each side of the sheathing joint. Joint width varies from 0 to 0.35 inches.
• 60.5-93.5 linear feet per 29-oz tube
• 38.5-60.5 linear feet per 20-oz sausage

Application Instructions
PREPARE
Prepare all surfaces as described above under “Preparation.” Once preparation is complete, cut open tip of threaded fitting, install nozzle and cut nozzle to desired opening.

Filling Joints, Seams and Cracks
1. Apply a thick bead of Joint & Seam Filler to all sheathing joints, seams and cracks. Joints up to ½ inch in width can be treated without backer rod. Treat joints ranging from ½ to 1 inch with backer rod before applying Joint & Seam Filler. Joints larger than 1 inch must be structurally improved or addressed with an appropriate transition membrane. On plywood, spot wood knots, deep cracks or surface irregularities.
2. Use a DRY joint knife, trowel or spatula to tool and spread the product. Spread 1 inch beyond seam on each side to a thickness of 20-30 mils.
3. Allow to skin before installing other waterproofing or air barrier components.

Waterproofing Fastener Penetrations
1. Spot fastener penetrations with Joint & Seam Filler, as necessary. On plywood, spot wood knots, deep cracks or surface irregularities.
2. Allow to skin before installing other waterproofing or air barrier components.

Detailing Rough Openings
1. Prime all raw gypsum board edges with R-Guard PorousPrep.

2. Apply a thick bead of Joint & Seam Filler to all inside corners, cracks, joints and seams within the rough opening.
3. Use a DRY joint knife, trowel or spatula to tool and spread the product. Spread 1 inch beyond seam on each side to a thickness of 20-30 mils.
4. Allow to skin before installing R-Guard PastFlash®.

PROTECT
Apply R-Guard Spray Wrap, MVP, Cat 5®, Cat 5® Rain Screen or other waterproofing or air barrier component pursuant to manufacturer instructions.

TRANSITION
Flashing Transitions
1. Fasten R-Guard SS ThruWall or other flashing leg to the vertical wall surface using a bead of Joint & Seam Filler or conventional methods. Fill any voids between the flashing leg and the vertical wall with Joint & Seam Filler.
2. Apply and tool Joint & Seam Filler as needed to direct water from the vertical wall to the face of SS ThruWall or other flashing.
3. Apply and tool Joint & Seam Filler at inside corners to ensure positive drainage.
4. Allow treated surfaces to skin before installing R-Guard PastFlash®.
5. Use Joint & Seam Filler to fill any remaining surface imperfections to provide positive drainage and continuous support of fluid-applied flashing membranes.

REPAIR
After applying R-Guard Spray Wrap MVP, Cat 5®, Cat 5® Rain Screen, VB or other waterproofing or air barrier component, Joint & Seam Filler may be used to fill any cracks or voids to achieve a seamless, pinhole and void free coating.

Curing and Drying
At 70°F (21°C) and 50% relative humidity, product skins within 30 minutes and dries in 4 hours. Paintable with most paints after 2 hours.
Joint & Seam Filler is moisture curing. Low temperatures and low relative humidity slow dry time. High temperatures and high relative humidity accelerate dry time.

Cleanup
Clean tools and equipment with mineral spirits or similar solvent immediately after use. Follow all safety precautions. Remove cured Joint & Seam Filler mechanically using a sharp-edged tool.
Product Data Sheet
R-Guard Joint & Seam Filler

WARRANTY
The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own tests to determine the suitability of such products for a particular purpose.

PROSOCO, Inc. warrants this product to be free from defects. Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for particular purpose. The purchaser shall be responsible to make his own tests to determine the suitability of this product for his particular purpose. PROSOCO's liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

CUSTOMER CARE
Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-285-4255 and ask for Customer Care – technical support.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-285-4255, or visit our web site at www.prosoco.com, for the name of the PROSOCO representative in your area.

BEST PRACTICES
Surfaces should be clean, free of standing water and in good repair before application. Most building surfaces can be cleaned using Enviro Klean® 2010 All Surface Cleaner. Information is available by calling Technical Customer Care at 800-285-4255.

In rough openings, prime raw gypsum board edges with R-Guard PorousPrep.

For best results, spread and tool Joint & Seam Filler while still wet, within 2-3 minutes of gun application.

Hot Weather Precautions: If air or surface temperatures exceed 95°F (35°C), apply to shaded surfaces and before daytime air and surface temperatures reach their peak. Hot surfaces may be cooled with a mist of fresh water. Surfaces may be damp but must be free of standing water before application. Keep containers closed and out of direct sunlight when not in use. Cold Weather Conditions: May be applied to frost-free substrates at temperatures below 52°F (0°C). Product will not start curing and drying until temperature rises to and remains above 32°F (0°C). Low Humidity Conditions: Curing may take longer than 12 hours. Lightly mist treated surfaces with fresh water to accelerate cure. Uncured material may delay construction. Use Joint & Seam Filler to adhere and gasket mechanically fastened building components. Use FastFlash™ to counter flash.

Use Joint & Seam Filler after the primary R-Guard air barrier has been applied to repair cracks or fill voids. PROSOCO R-Guard®, Joint & Seam Filler, FastFlash® and AirDam® are recommended for improved performance of R-Guard Spray Wrap MVP, VB, Cat 5® and Cat 5® Rain Screen water-resistant barrier coatings.

Illustrations depicting the use of PROSOCO R-Guard® products are available at www.prosoco.com by downloading the R-Guard Installation Guidelines.

To schedule field technical support, contact your PROSOCO Technical Customer Care toll-free at 800-285-4255. Field visits by PROSOCO personnel are for the purpose of making technical recommendations only. PROSOCO is not responsible for providing job site supervision or quality control. Proper application is the responsibility of the applicator.
## PRODUCT TEST RESULTS

**R-Guard Joint & Seam Filler**

### ICC-ES AC212: ACCEPTANCE CRITERIA FOR WATER-RESISTIVE COATINGS USED AS WATER-RESISTIVE BARRIERS OVER EXTERIOR SHEATHING ("JOINT & SEAM FILLER TESTED AS PART OF AN ASSEMBLY")

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Bond</td>
<td>ASTM C 297</td>
<td>Minimum 15 psi (105 kPa)</td>
<td>Pass</td>
</tr>
<tr>
<td>Freeze-Throw</td>
<td>ICC-ES AC212</td>
<td>No cracking, checking, crazing, erosion, delamination or other deleterious effects</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>ASTM D 2847</td>
<td>No cracking, checking, crazing, erosion, delamination, or other deleterious effects</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Penetration</td>
<td>ASTM E 801</td>
<td>No visible water penetration at sheathing joints as viewed from back of the panel</td>
<td>Pass</td>
</tr>
<tr>
<td>Structural, Recking,</td>
<td>ASTM E 1333A</td>
<td>No cracking of the coating</td>
<td>Pass</td>
</tr>
<tr>
<td>Restrained Environmental</td>
<td>ASTM E 73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditioning &amp; Water</td>
<td>ICC-ES AC212</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penetration</td>
<td>ASTM E 901</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weathering</td>
<td>ICC-ES AC313</td>
<td>No cracking of the coating; no water penetration</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>AATCC 127</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ABAA: AIR BARRIER ASSOCIATION OF AMERICAN ACCEPTANCE CRITERIA FOR LIQUID APPLIED MEMBRANES ("JOINT & SEAM FILLER TESTED AS PART OF AN ASSEMBLY")

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Leaksage of Air</td>
<td>ASTM E 2047</td>
<td>≤ 0.2 L / s·m² at 75 Pa (≤ 0.04 cfm / ft² at 1.57 psf)</td>
<td>Pass 0.01/05 / s·m² at 75 Pa (0.0021 cfm / ft² at 1.57 psf)</td>
</tr>
<tr>
<td>Barrier Assemblies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FIRE TESTING ("JOINT & SEAM FILLER TESTED AS PART OF AN ASSEMBLY")

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Propagation Characteristics of Exterior Non-load-bearing Wall Assemblies</td>
<td>NPPA 285</td>
<td>Must resist flame propagation and flame spread</td>
<td>Pass¹</td>
</tr>
<tr>
<td>Surface Burning Characteristics</td>
<td>ASTM E 84</td>
<td>Criteria for ICC and NPPA Class A Building Material. Flame Spread ≤ 25; Smoke Developed ≤ 450</td>
<td>Meets Class A Building Material. Flame Spread: 15; Smoke Developed: 5</td>
</tr>
</tbody>
</table>

All testing was completed by independent, accredited laboratories.

### NOTES:

1. International Code Council Evaluation Service Acceptance Criteria 212
2. American Association of Textile Chemists and Colorists
3. National Fire Protection Association
4. Southwest Research Institute Report No. 01-17421.01.001
SAFETY DATA SHEET
PROSOCO, Inc.

Issue Date 11-Aug-2014  Revision Date 26-Jan-2016

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Identifier
Product Name PROSOCO R-Guard® Joint & Seam Filler

Other means of identification
Product Code 70410

Recommended use of the chemical and restrictions on use
Recommended Use Restricted to professional users.
Uses advised against No information available

Details of the supplier of the safety data sheet
Manufacturer Address
PROSOCO, Inc.
3741 Greenway Circle
Lawrence, Kansas 66046

Emergency telephone number
8:00 AM – 5:00 PM CST Monday-Friday 785-865-4200
NON-BUSINESS HOURS (INFOTRAC) 800-535-5053

2. HAZARDS IDENTIFICATION

Classification
Reproductive toxicity Category 1B

Label elements

Emergency Overview

Hazard statements
May damage fertility or the unborn child

Appearance viscous Physical state Paste/Gel Liquid Odor Mild

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required

Precautionary Statements - Response
IF exposed or concerned: Get medical advice/attention
Precautionary Statements - Storage
Store locked up.

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant.

Hazard not otherwise classified (HNOC)
No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary - Styil Terminated Polyether</td>
<td>Undisclosed</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Limestone</td>
<td>1317-65-3</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Polypropylene glycol</td>
<td>25322-69-4</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Precipitated Calcium Carbonate</td>
<td>471-34-1</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Aminoethyl aminopropyl trimethoxy silane</td>
<td>1760-24-3</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>13463-67-7</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Polyethylene Terephthalate</td>
<td>26038-59-9</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Dibutylin Diacetylacetonate</td>
<td>22673-19-4</td>
<td>0.1 - 1</td>
<td>*</td>
</tr>
</tbody>
</table>

* The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures

General advice
Do not get in eyes, on skin, or on clothing. If symptoms persist, call a physician.

Eye contact
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. If symptoms persist, call a physician.

Skin Contact
Wipe off material with a dry cloth. Wash with soap and water. Consult a physician if necessary.

Inhalation
Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Call a physician.

Ingestion
Do NOT induce vomiting. Rinse mouth. Drink plenty of water. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

Self-protection of the first aider
Use personal protective equipment as required.

Most Important symptoms and effects, both acute and delayed

Symptoms
May be harmful if swallowed. May cause irritation.

Indication of any immediate medical attention and special treatment needed

Note to physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES
Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Small Fire  
Dry chemical or CO2. Foam.

Large Fire  
Water spray or fog. Foam.

Unsuitable Extinguishing Media  
Caution: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical
No information available.

Hazardous combustion products
Carbon oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Ensure adequate ventilation, especially in confined areas.

Environmental precautions

Environmental precautions
Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions
Keep out of the reach of children. Keep container tightly closed in a dry and well-ventilated place.

Incompatible materials
Acids. Incompatible with oxidizing agents.

8. EXPOSURE CONTROLS/PERSORAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone 1317-65-3</td>
<td>-</td>
<td>TWA: 15 mg/m³ total dust; 5 mg/m³ respirable fraction (vacated) TWA: 15 mg/m³ total dust; TWA: 5 mg/m³ respirable dust</td>
<td>TWA: 10 mg/m³ total dust</td>
</tr>
</tbody>
</table>
70410 PROSOCO R-Guard® Joint & Seam Filler

Revision Date 26-Jan-2016

<table>
<thead>
<tr>
<th>Precipitated Calcium Carbonate</th>
<th>-</th>
<th>respirable fraction</th>
<th>-</th>
<th>TWA: 10 mg/m³ total dust</th>
<th>TWA: 5 mg/m³ respirable dust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 15 mg/m³ total dust (vaccinated) TWA: 10 mg/m³ total dust</td>
<td>IDLH: 5000 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13463-67-7</td>
<td>STEL: 0.2 mg/m³ Sn TWA: 0.1 mg/m³ Sn</td>
<td>TWA: 0.1 mg/m³ Sn (vaccinated) TWA: 0.1 mg/m³ Sn</td>
<td>IDLH: 25 mg/m³ Sn TWA: 0.1 mg/m³ except Cyanmethine Sn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dibutylin Diacetylacetonate</td>
<td>22073-19-4</td>
<td>S*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NIOSH IDLH: Immediately Dangerous to Life or Health

Other Information
Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls
None under normal use conditions.

Engineering Controls

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles).
Skin and body protection: Wear protective gloves and protective clothing.
Respiratory protection: If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations
Do not eat, drink or smoke when using this product. Take off all contaminated clothing and wash it before reuse. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Paste/Gel Liquid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Viscous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Light red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Mild</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Not Applicable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiling point/bolling range</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 100 °C / &gt; 212 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.4 - 1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>Insoluble in water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to avoid
Extremes of temperature and direct sunlight.

Incompatible materials
Acids incompatible with oxidizing agents.

Hazardous Decomposition Products
Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information
May be harmful by inhalation, ingestion, or skin absorption

Inhalation
Avoid breathing vapors or mists.

Eye contact
Avoid contact with eyes.

Skin Contact
Avoid contact with skin.

Ingestion
Do not taste or swallow.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene glycol</td>
<td>&gt; 2 g/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>25322-69-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precipitated Calcium Carbonate</td>
<td>&gt; 6450 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>471-34-1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stearic acid</td>
<td></td>
<td>&gt; 5 g/kg (Rabbit)</td>
<td>-</td>
</tr>
<tr>
<td>57-11-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aminoethyl aminopropyl trimethoxy silane</td>
<td>&gt; 7460 mL/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1760-24-3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>&gt; 10000 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13463-67-7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
May be harmful if swallowed. May cause irritation.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Reproductive toxicity
May damage fertility or the unborn child.

STOT - single exposure
No information available.

STOT - repeated exposure
No information available.

Aspiration hazard
No information available.
Numerical measures of toxicity - Product information

The following values are calculated based on chapter 3.1 of the GHS document.

ATEmix (oral) 5413 mg/kg
ATEmix (dermal) 21527 mg/kg ml

12. ECOLOGICAL INFORMATION

Ecotoxicity

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Other adverse effects
No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
Do not reuse container.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT
Not Regulated for all modes of transportation.

15. REGULATORY INFORMATION

International Inventories

TSCA
Complies

DSL/NDSL
Non-controlled

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any
chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
- Acute health hazard: Yes
- Chronic Health Hazard: No
- Fire hazard: No
- Sudden release of pressure hazard: No
- Reactive Hazard: No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 307). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide 13463-67-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>Quartz 14808-60-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>Methanol 67-56-1</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone 1317-65-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Titanium dioxide 13463-67-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quartz 14808-60-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

NFPA
- Health hazards: 2
- Flammability: 0
- Instability: 0

HMIS
- Health hazards: 2
- Flammability: 0
- Physical hazards: 0
- Personal protection: X

Issue Date: 11-Aug-2014
Revision Date: 26-Jan-2016
Revision Note: SDS sections updated
2:6
For product produced after February 2, 2016

Disclaimer
The information contained on the Safety Data Sheet has been compiled from data considered accurate. This data is believed to be reliable, but it must be pointed out that values for certain properties are known to vary from source to source. PROSOCO, Inc. expressly disclaims any warranty express or implied as well as any liability for any injury or loss arising from the use of this information or the materials described. This data is not to be construed as absolutely complete since additional data may be desirable when particular conditions or circumstances exist. It is the responsibility of the user to determine the best precautions necessary for the safe handling and use of this product for his unique application. This data relates only to the specific material designated and is not to be used in combination with any other material. Many federal and state regulations pertain directly or indirectly to the product’s end use and disposal of containers and unused material. It is the purchaser’s responsibility to familiarize himself with all applicable regulations.
PROSOCO R-Guard® AirDam® is a gun-grade waterproofing sealant combining the best of silicone and polyurethane properties. Installed as the interior air sealant, AirDam® creates a long lasting, weather-tight seal that prevents moist outside air from entering, and conditioned indoor air from escaping around window and door assemblies. This ensures wind driven rain and condensed water are diverted to the flashing membrane and water resistive barrier before it can enter the living space.

This single component, Silly-Terminated-Poly-Ether (STPE) is easy to gun and tool in all weather conditions. AirDam® is immediately waterproof and can be applied in unfavorable weather conditions to dry or damp substrates, eliminating many weather-related construction delays and accelerating the “drying in” of new buildings.

AirDam® cures quickly to produce a durable, high performance, high movement elastomeric sealant. Appropriate for exterior or interior use, AirDam® is easily applied with standard caulking tools. AirDam® bonds tenaciously and can be used with all types of window and door frame material – vinyl, wood or metal, including painted metal. As a properly applied interior window sealant, AirDam® can substantially reduce a building’s heating and cooling costs.

ADVANTAGES

• Solvent free. Isoyanurate free. Complies with all AIM VOC regulations.
• Silane functional polymer provides superior long term adhesion, crack bridging and weathering characteristics.
• Bonds to most common building materials without priming.
• Produces a durable, weather-tight seal.
• Suitable for exterior or interior use.
• Stops penetration of air and water under normal and extreme weather conditions.
• Single component formulation saves time and requires no mixing.
• Easy to gun and tool in all climates.
• Bonds and cures in wet weather and on damp substrates.
• Compatible with most sealants and waterproofing or air barrier components.
• No shrinkage. No staining. Non-yellowing.
• Breathable – allows damp surfaces to dry.
• Will not support mold growth.
• Cured service temperatures: -75°F to 300°F.
(−59°C to 149°C).

Limitations

• Not for use bridging gaps more than 2 inches wide.
• Not for underwater applications.
• Not for applications in direct contact with strong acids or solvents.

REGULATORY COMPLIANCE

VOC Compliance

R-Guard AirDam® is compliant with the following national, state and district AIM VOC regulations:

☐ US Environmental Protection Agency
☐ California Air Resources Board SCM Districts
☐ South Coast Air Quality Management District
☐ Maricopa County, AZ
☐ Northeast Ozone Transport Commission
Product Data Sheet
R-Guard AirDam®

TYPICAL TECHNICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORM</td>
<td>viscus white paste, mild odor</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>1.3-1.4</td>
</tr>
<tr>
<td>pH</td>
<td>not applicable</td>
</tr>
<tr>
<td>WT/GAL</td>
<td>11.84 lbs</td>
</tr>
<tr>
<td>TOTAL SOLIDS</td>
<td>88%</td>
</tr>
<tr>
<td>VOC CONTENT</td>
<td>30 g/L maximum</td>
</tr>
<tr>
<td>FLASH POINT</td>
<td>&gt;200 °F (&gt;93° C)</td>
</tr>
<tr>
<td>FREEZE POINT</td>
<td>not applicable</td>
</tr>
<tr>
<td>SHELF LIFE</td>
<td>1 year in tightly sealed, unopened container</td>
</tr>
</tbody>
</table>

Cured Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness, Shore A</td>
<td>15-25</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>85 psi</td>
</tr>
<tr>
<td>Elongation at Break</td>
<td>1000%</td>
</tr>
<tr>
<td>Peel Strength</td>
<td>25 pli</td>
</tr>
</tbody>
</table>

SAFETY INFORMATION

Always read full label and SDS for precautionary instructions before use. Use appropriate safety equipment and job site controls during application and handling.

24 Hour Emergency Information: INFOTRAC at 800-535-5053

PREPARATION

Protect people, vehicles, property, plants, and all other surfaces not intended to receive AirDam®. Surfaces must be structurally sound and free of any surface contaminants, chemical residues, surface coatings or films that may adversely affect adhesion. Pressure-treated wood and other contaminated surfaces should be cleaned with a solvent wipe before application.

Joint Preparation

For joints less than one-half (½) inch wide, sealant depth should be equal to the width of the joint.

For joints ranging from one-half (½) to one (1) inch wide, sealant depth should be approximately one-half (½) the joint width.

In deep joints, control sealant depth by installing closed cell backer rod. The diameter of soft backer rod should be 85% greater than the joint width. Do not puncture backer rod.

Where joint depth does not permit use of a backer rod, install bond breaker tape to prevent three point bonding.

Surface and Air Temperatures

Surface and ambient temperatures should be 65°F (18°C) and rising and below 110°F (43°C) during application and drying. If air or surface temperatures exceed 95°F (35°C), apply to shaded surfaces and before daytime air and surface temperatures reach their peak. See Best Practices for hot weather installation instructions.

Though AirDam® may be applied to damp surfaces and tolerates rain immediately after application, do not apply to surfaces with standing water or frost.

Equipment

Apply using standard caulking tools.

To tool the product, use a DRY joint knife slightly wider than the gap or joint opening. Do not use soapy water when tooling or spreading.

Storage & Handling

Store in a cool, dry place. Keep container tightly closed when not in use. Do not open cartridges or sausages until preparation work has been completed. Do not alter or mix with other chemicals. When stored at or below 80°F (27°C), AirDam® has a shelf life of 12 months after the date of manufacture. This shelf life assumes upright storage of factory-sealed containers. Do not double-stack pallets. Keep out of the reach of children. Dispose of in accordance with local, state and national regulations.

APPLICATION

Before use, read “Preparation” and the Safety Data Sheet. ALWAYS TEST each surface for suitability and desired results before overall application. Use the following application instructions. Let the surface dry thoroughly before inspection and approval.

Dilution & Mixing

Apply as packaged. Do not dilute or alter, or use for applications other than specified. AirDam® is ready to use. No mixing is required.
Product Data Sheet
R-Guard AirDam™

Coverage Rates
Coverage varies depending on the width and depth of joints. When overlapping onto adjacent surfaces, rough surface irregularities will reduce coverage. Use the table below as a guideline when estimating sealant requirements.

<table>
<thead>
<tr>
<th>JOINT SIZE (D x W)</th>
<th>Linear Ft Sealed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30-oz Sausage</td>
</tr>
<tr>
<td>8/16 x 1/4 inches</td>
<td>64</td>
</tr>
<tr>
<td>3/16 x 1/2 inches</td>
<td>32</td>
</tr>
<tr>
<td>1/4 x 1/4 inches</td>
<td>48</td>
</tr>
<tr>
<td>1/4 x 1/2 inches</td>
<td>24</td>
</tr>
<tr>
<td>3/8 x 3/8 inches</td>
<td>21</td>
</tr>
<tr>
<td>3/8 x 5/8 inches</td>
<td>13</td>
</tr>
<tr>
<td>1/2 x 1/2 inches</td>
<td>12</td>
</tr>
<tr>
<td>1/2 x 3/4 inches</td>
<td>8</td>
</tr>
</tbody>
</table>

Application Instructions
1. Using a professional grade caulking gun, install sealant in a continuous bead without gaps or air pockets.
2. Tool sealant immediately to ensure complete wetting of joint bond surface and to produce a smooth, concave joint profile flush with the edges of adjacent surfaces. DO NOT use water, soapy water or solvent to tool. Avoid over tooling. Where horizontal and vertical surfaces meet, tool sealant to create a slight cove which will not trap moisture or debris.

Curing and Drying
AirDam® cures at the rate of 1/8 inch of depth per day. High humidity accelerates curing and drying time.

Cleanup
Clean tools and equipment immediately with mineral spirits or similar solvent.

BEST PRACTICES
AirDam® bonds tenaciously. Carefully protect all nearby surfaces not intended to be treated. Immediately clean up incidental contact using mineral spirits or similar solvent. Use as is. Do not thin or alter in any way.
Apply using a professional caulking gun. To tool the product, use a DRY joint knife slightly wider than the gap or joint opening. Do not use water, soapy water or solvent when tooling or spreading. Avoid over tooling.
Allow for drying time based on temperature and humidity. AirDam® cures at the rate of 1/8 inch of depth per day. High humidity decreases dry-time. Low temperatures and low relative humidity will extend cure time.

Hot Weather Installations: when practical install AirDam® to shaded surfaces. When conditions are hot and dry, cool and dampen the surface with a fresh water mist. Allow standing water to dry before installation.

PROSOCO R-Guard® Joint & Seam Filler, FastFlash® and AirDam® are recommended for improved performance of R-Guard Cat 5®, Cat 5® Rain Screen, Spray Wrap MVP and VB water-resistant barrier coatings.

Illustrations depicting the use of R-Guard products are available at www.prosoco.com by downloading the R-Guard Installation Guidelines.

To schedule field technical support, contact your PROSOCO Technical Customer Care toll-free at 800-255-4355. Field visits by PROSOCO personnel are for the purpose of making technical recommendations only. PROSOCO is not responsible for providing job site supervision or quality control. Proper application is the responsibility of the applicator.
WARRANTY

The information and recommendations made are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible application of our products, nor anticipate every variation encountered in masonry surfaces, job conditions and methods used. The purchasers shall make their own test to determine the suitability of such products for a particular purpose.

PROSOCO, Inc. warrants this product to be free from defects. Where permitted by law, PROSOCO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of merchantability or fitness for particular purpose. The purchaser shall be responsible to make his own tests to determine the suitability of this product for his particular purpose. PROSOCO’s liability shall be limited in all events to supplying sufficient product to re-treat the specific areas to which defective product has been applied. Acceptance and use of this product absolves PROSOCO from any other liability, from whatever source, including liability for incidental, consequential or resultant damages whether due to breach of warranty, negligence or strict liability. This warranty may not be modified or extended by representatives of PROSOCO, its distributors or dealers.

CUSTOMER CARE

Factory personnel are available for product, environment and job-safety assistance with no obligation. Call 800-255-4255 and ask for Customer Care – technical support.

Factory-trained representatives are established in principal cities throughout the continental United States. Call Customer Care at 800-255-4255, or visit our web site at www.prosoco.com, for the name of the PROSOCO representative in your area.
# PRODUCT TEST RESULTS

**R-Guard AirDam**

## ASTM C 920: STANDARD SPECIFICATION FOR ELASTOMERIC JOINT SEALANTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheological Properties</td>
<td>ASTM C 630</td>
<td>Vertical slump at 40 ± 3.6°F must be ≤ 3/16&quot; Vertical slump at 122 ± 3.6°F must be ≤ 3/16&quot; Horizontal slump at 40 ± 3.6°F, no deformation Horizontal slump at 122 ± 3.6°F, no deformation</td>
<td>Pass: 0 Pass: 0 Pass: no deformation Pass: no deformation</td>
</tr>
<tr>
<td>Extrusion Rate</td>
<td>ASTM C 1130 Procedure A</td>
<td>Report Specific Gravity Extrusion Rate ≥ 10.0 mL/min</td>
<td>1.4 94.9 mL/min</td>
</tr>
<tr>
<td>Application Life: Type M, Grade P Only</td>
<td>ASTM C 1193 Procedure A</td>
<td>Not applicable for Type S, Grade NS</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Hardness</td>
<td>ASTM C 661</td>
<td>Indentation Hardness &lt;60</td>
<td>Pass: 16</td>
</tr>
<tr>
<td>Effects of Heat Aging</td>
<td>ASTM C 1840</td>
<td>Percent Weight Loss ≥7% Visual Examination for presence of cracks or chalking</td>
<td>Pass: 0.96% Pass: no cracking or chalking</td>
</tr>
<tr>
<td>Tack-Free Time</td>
<td>ASTM C 679</td>
<td>&lt; 72 hours</td>
<td>Pass: 1.7 hours</td>
</tr>
<tr>
<td>Stain and Color Change</td>
<td>ASTM C 810</td>
<td>No visible stain or color change</td>
<td>Pass</td>
</tr>
<tr>
<td>Adhesion and Cohesion Under Cyclic Movement</td>
<td>ASTM C 719</td>
<td>Aggregate loss in bond and cohesion ≤1/16 in²</td>
<td>Pass 0 on vinyl 0 on aluminum 0 on wood</td>
</tr>
<tr>
<td>Adhesion-in-Peel</td>
<td>ASTM C 794</td>
<td>Aggregate loss in bond and cohesion ≥5 lbf</td>
<td>Pass 10.4 lbf on vinyl 13.5 lbf on aluminum 10.5 lbf on wood</td>
</tr>
<tr>
<td>Adhesion-in-Peel exposed to UV through glass</td>
<td>ASTM C 704 ASTM C 1442</td>
<td>Aggregate loss in bond and cohesion ≥5 lbf</td>
<td>≥5 lbf</td>
</tr>
<tr>
<td>Effects of Accelerated Weathering</td>
<td>ASTM C 703 ASTM C 1442</td>
<td>Visual inspection for cracking after accelerated weathering and after cold exposure and low temperature bend (Example #2 in ASTM C 703)</td>
<td>Pass: no cracking</td>
</tr>
</tbody>
</table>

## SEALANT, WATERPROOFING AND RESTORATION INSTITUTE’S PRODUCT VALIDATION PROGRAM

| Adhesion and Cohesion Under Cyclic Movement (≤24%) | ASTM C 719 | Aggregate loss in bond and cohesion ≤1/16 in² | Pass 0 on vinyl 0 on aluminum 0 on wood |

## OTHER (R-Guard AirDam® tested as part of an assembly)

| Air Leakage of Air Barrier Assemblies | ASTM E 2887 | ≤ 0.2 L/s·m² at 70 Pa (≤ 0.04 cfm/ft² at 1.57 psf) | Pass ≤0.001 L/s·m² at 70 Pa (0.0003 cfm/ft² at 1.57 psf) |

*All testing was completed by independent, accredited laboratories.*
SAFETY DATA SHEET
PROSOCO, Inc.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name
PROSOCO R-Guard® AirDam®

Other means of identification
Product Code
70440

Recommended use of the chemical and restrictions on use
Recommended Use
Restricted to professional users.

Uses advised against
No information available

Details of the supplier of the safety data sheet
Manufacturer Address
PROSOCO, Inc.
3741 Greenway Circle
Lawrence, Kansas 66046

Emergency telephone number
8:00 AM – 5:00 PM CST Monday-Friday
785-865-4200
NON-BUSINESS HOURS (INFOTRAC)
800-535-5053

2. HAZARDS IDENTIFICATION

Classification
Reproductive toxicity Category 1B

Label elements

Danger

Hazard statements
May damage fertility or the unborn child

Emergency Overview

Appearance viscous Physical state paste Odor Mild

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required

Precautionary Statements - Response
IF exposed or concerned. Get medical advice/attention

Page 1/7
Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Hazard not otherwise classified (HNOC)
Other Information
No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitated Calcium Carbonate</td>
<td>471-34-1</td>
<td>15 - 40</td>
<td>*</td>
</tr>
<tr>
<td>Proprietary - Silyl Terminated Polyether</td>
<td>Undisclosed</td>
<td>15 - 40</td>
<td>*</td>
</tr>
<tr>
<td>Polypropylene glycol</td>
<td>25322-69-4</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Stearic acid</td>
<td>57-11-4</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Limestone</td>
<td>1317-65-3</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>13463-07-7</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Aminoethyl aminopropyl trimethoxy silane</td>
<td>1760-24-3</td>
<td>1 - 5</td>
<td>*</td>
</tr>
<tr>
<td>Diethyltin Diacetyldiacetonate</td>
<td>22673-19-4</td>
<td>0.1 - 1</td>
<td>*</td>
</tr>
</tbody>
</table>

* The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

First aid measures
General advice
If symptoms persist, call a physician. Do not get in eyes, on skin, or on clothing.

Eye contact
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eyes wide open while rinsing. If symptoms persist, call a physician.

Skin Contact
Wipe off material with a dry cloth. Wash with soap and water. Consult a physician if necessary.

Inhalation
Remove to fresh air. If symptoms persist, call a physician.

Ingestion
Do NOT induce vomiting. Rinse mouth. Drink plenty of water. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

Self-protection of the first aider
Use personal protective equipment as required.

Most important symptoms and effects, both acute and delayed
Symptoms
May be harmful if swallowed. May cause irritation.

Indication of any immediate medical attention and special treatment needed
Note to physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Small Fire  
Dry chemical or CO₂. Foam.

Large Fire  
Water spray or fog. Foam.

Unsuitable Extinguishing Media  
Caution. Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical  
None known.

Protective equipment and precautions for firefighters  
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions  
Use personal protective equipment as required.

Environmental precautions

Environmental precautions  
Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment  
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up  
Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling  
Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions  
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.

Incompatible materials  
Acids. Incompatible with oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitated Calcium Carbonate 471-34-1</td>
<td>-</td>
<td>-</td>
<td>TWA: 10 mg/m³ total dust TWA: 5 mg/m³ respirable dust</td>
</tr>
<tr>
<td>Limestone 1317-65-3</td>
<td>-</td>
<td>TWA: 5 mg/m³ total dust TWA: 15 mg/m³ respirable fraction (vacated) TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction</td>
<td></td>
</tr>
<tr>
<td>Titanium dioxide 13463-67-7</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 15 mg/m³ total dust (vacated) TWA: 10 mg/m³ total</td>
<td>IDLH: 5000 mg/m³</td>
</tr>
</tbody>
</table>
Other Information
Vacant limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Engineering Controls
None under normal use conditions.

Individual protective measures, such as personal protective equipment
Eye/face protection Wear safety glasses with side shields (or goggles).
Skin and body protection Wear protective gloves and protective clothing.
Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations
Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing. Take off all contaminated clothing and wash it before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks - Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Paste</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Appearance</td>
<td>Viscous</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Mid</td>
<td></td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Boiling point/bubbling range</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 100 °C / &gt; 212 °F</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.3 - 1.4</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>Insoluble</td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY
Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to avoid
Extremes of temperature and direct sunlight.

Incompatible materials
Acids. Incompatible with oxidizing agents.

Hazardous Decomposition Products
Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information
May be harmful by inhalation, ingestion, or skin absorption

Inhalation
Avoid breathing vapors or mists.

Eye contact
Avoid contact with eyes.

Skin Contact
Avoid contact with skin.

Ingestion
Do not taste or swallow.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitated Calcium Carbonate 471-34-1</td>
<td>= 6450 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Polycarbonate glycol 25322-49-4</td>
<td>&gt; 2 g/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stearic acid 57-11-4</td>
<td>-</td>
<td>&gt; 5 g/kg (Rabbit)</td>
<td>-</td>
</tr>
<tr>
<td>Titanium dioxide 13463-67-7</td>
<td>&gt; 10000 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Aminoethylaminopropyltrimethoxy silane 1760-24-3</td>
<td>= 7460 µg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
May cause irritation. May be harmful if swallowed.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Reproductive toxicity
May damage fertility or the unborn child.

STOT - single exposure
No information available.

STOT - repeated exposure
No information available.

Aspiration hazard
No information available.

Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document.

ATEmix (oral) 5305 mg/kg
ATEmix (dermal) 64430 mg/kg mg/l
ATEmix (inhalation-dust/mist) 491 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicity

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Other adverse effects
No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
Do not reuse container.

This product contains one or more substances that are listed with the State of California as a hazardous waste.

14. TRANSPORT INFORMATION

DOT
Not Regulated for all modes of transportation.

15. REGULATORY INFORMATION

International Inventories

TSCA
Complies

DSL/NDSL
Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
Acute health hazard Yes  
Chronic Health Hazard No  
Fire hazard No  
Sudden release of pressure hazard No  
Reactive Hazard No  

CWA (Clean Water Act)  
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)  

CERCLA  
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material  

US State Regulations  

California Proposition 65  
This product contains the following Proposition 65 chemicals

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide - 13463-67-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>Methanol - 67-56-1</td>
<td>Developmental</td>
</tr>
<tr>
<td>Quartz - 14808-60-7</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone 1317-65-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Titanium dioxide 13463-67-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Methanol 67-56-1</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

NFPA  
Health hazards 2  
Flammability 0  
Instability 0  
Physical and Chemical Properties -  

HMIS  
Health hazards 2  
Flammability 0  
Physical hazards 0  
Personal protection X

Prepared By Regulatory Department  
Issue Date 27-Aug-2014  
Revision Date 28-Jan-2016  
Revision Note SDS sections updated 2 3 4 6 11  
For product produced after February 22, 2016

Disclaimer  
The information contained on the Safety Data Sheet has been compiled from data considered accurate. This data is believed to be reliable, but it must be pointed out that values for certain properties are known to vary from source to source. PROSOCO, Inc. expressly disclaims any warranty express or implied as well as any liability for any injury or loss arising from the use of this information or the materials described. This data is not to be construed as absolutely complete since additional data may be desirable when particular conditions or circumstances exist. It is the responsibility of the user to determine the best precautions necessary for the safe handling and use of this product for his unique application. This data relates only to the specific material designated and is not to be used in combination with any other material. Many federal and state regulations pertain directly or indirectly to the product's end use and disposal of containers and unused material. It is the purchaser's responsibility to familiarize himself with all applicable regulations.

End of Safety Data Sheet
e. Engineering Documents

1. Review of Build SMART J-Form Foundation System

We have reviewed the Build SMART J Form foundation, part of the Build SMART energy efficient building system for its appropriateness for use in residential and non-residential construction.

Abstract

The Build SMART house building system is a system of building construction techniques formulated to achieve a highly efficient residential or non-residential building. The Build SMART J Form Passivhaus Foundation comprises the slab foundation component of the Build SMART system. Its primary distinguishing feature is the placement of rigid insulation, of expanded polystyrene material (EPS), between the edge of a stiffened concrete slab-on-grade and the receiving foundation material. This review focuses on the applicability of the Build SMART J Form Passivhaus Foundation as it is formulated for residential construction without basements and utilizing light wood or metal framing with no masonry veneer or masonry components above the foundation structure. This foundation system is shown in Figure 1 below.
Allowable Superimposed Load on Concrete Slab Turn-Down

<table>
<thead>
<tr>
<th>Soil Bearing Pressure</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
<th>3500</th>
<th>4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-Down Load</td>
<td>3000</td>
<td>4100</td>
<td>5200</td>
<td>6300</td>
<td>6400</td>
<td>6400</td>
</tr>
<tr>
<td>Lb/ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1

Analysis

Soil Bearing Pressure

The International Residential Code 2012 (IRC), chapter 4, and the International Building Code 2012 (IBC), chapter 18, contain prescriptive requirements for foundation design. Prescriptive requirements are those code requirements for which no onsite material determinations are required – no investigation is required to determine allowable soil bearing capacity. Table R401.4.1 in IRC and Table 1806.2 in IBC list presumptive soil bearing capacities for various soil classes. These range from 1500 pounds per square foot (psf) for soils of clay and silt makeup to 4000 psf for sedimentary rock.
Footing Width

IRC, in Table R403.1, and IBC, in Table 1809.7, give minimum footing widths for light frame construction. The most restrictive of these, 23" for a three story structure on soil with a bearing capacity of 1500 psf in Table R403.1, is less than the 26" footing width of the Build SMART J Form. Accordingly, the Build SMART Foundation complies with both building codes with regard to footing width.

Design Considerations Regarding the EPS Rigid Foam Component

The use of EPS rigid foam as part of the load-bearing component of a foundation structure carries with it a limitation on the bearing pressure between it and the concrete element of the foundation structure. It has been recognized by the industry and design community that EPS, under constant load, undergoes a physical compression, or shrinkage, over a period of time. This compression is directly related to the intensity of the compression stress within it and to the duration of time over which it is under load.

The most common way this characteristic of EPS is expressed is in terms of the compressive stress at which a certain magnitude of compressive strain, or shrinkage, may be expected. The compressive stresses are commonly listed at shrinkage levels of 5% and 10%. The thickness of the EPS between the perimeter stiffener, or “turn-down” of the concrete slab-on-grade is 8 inches. 5% of this thickness is 0.4", or about 3/8". For the purposes of this review, 5% EPS strain is taken to be the criterion for EPS loading. Light frame construction resting on the Build SMART J Form Foundation can easily sustain this level of downward movement due to compressive strain, or shrinkage of the EPS.

EPS used in the Build SMART J Form is “EPS Geofoam” manufactured by Cellofoam North America, Inc. American Society for Testing and Materials (ASTM) has published a specification for EPS foam material, ASTM D6817, in which EPS material was assigned designations for various foam densities, EPS12, EPS15, EPS19, etc. The two digit numerical part of the designation relates to the density of the material. The greater the density, the higher the level of compressive stress the material can sustain for an expected strain – 5%, 10%, etc. The foam material used in the Build SMART J Form is EPS46 which possess a density of 2.85 pounds per cubic foot (pcf).

The 5% compressive strength, per ASTM D6817, published by Cellofoam North America for EPS Geofoam, EPS46 is 46 psi or 6620 psf.

Thus the EPS used in the Build SMART J Form is appropriate for use on soils with allowable bearing pressures certainly as high as 4000 psf.

Interaction of J Form With Concrete Bearing Element

Figure 1 illustrates that the J Form serves to spread the compressive load from the bottom of the 12" wide concrete "turn-down" to the soil, transverse to the length of the slab edge. Consequently, for a given foundation load the compressive stress in the EPS at the interface between the concrete turn-down is higher than at the bearing of the foam on the soil. For low values of allowable soil bearing pressure the soil strength governs the allowable load that can be superimposed on the concrete turn-down. For higher values of allowable soil bearing the limitation on the compressive stress at the concrete turn-down / EPS interface govern. This is shown in Table 1, below:
Table 1

<table>
<thead>
<tr>
<th>Soil Bearing Pressure psf</th>
<th>Pressure at Bottom of Turn-Down psf</th>
<th>EPS Compressive Load lb/ft</th>
<th>Allowable Net Foundation Load lb/ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>3250</td>
<td>3250</td>
<td>3000</td>
</tr>
<tr>
<td>2000</td>
<td>4330</td>
<td>4330</td>
<td>4100</td>
</tr>
<tr>
<td>2500</td>
<td>5420</td>
<td>5420</td>
<td>5200</td>
</tr>
<tr>
<td>3000</td>
<td>6500</td>
<td>6500</td>
<td>6300</td>
</tr>
<tr>
<td>3500</td>
<td>7580</td>
<td>6620</td>
<td>6400</td>
</tr>
<tr>
<td>4000</td>
<td>8670</td>
<td>6620</td>
<td>6400</td>
</tr>
</tbody>
</table>

The table reveals that, if the foundation material possesses an allowable bearing capacity of more than 3500 psf, the maximum foundation load that can be placed on the concrete turn-down is limited to 6400 lbs/ft. This is, practically, a limitation on the use of the Build SMART J Form foundation since it is quite rare that the soil at a project possesses a bearing strength higher than 3500 psf.

Summary

The use of EPS rigid foam in the construction of the Build SMART J Form foundation for light framed construction is quite appropriate, structurally, and the Allowable Superimposed Foundation Loads table in Figure 1 can be safely and confidently used to assure compliance with both the International Residential Code 2012 and the International Building Code 2012, and with conservative structural design practice.

Sincerely,

Ron Shiflett, PE
2. Foundation Sections

CROSS SECTION OF IDEAL PRECAST FOUNDATION WALL AREAS WHERE THERE IS 12" OR MORE OF BACKFILL
4000 PSI MAXIMUM UNIFORM LOAD

ANCHOR BOLT 6 1/4" FROM FACE OF WALL
1/2" SIMPSON WEDGE-ALL OR EQUAL
30" DUL. (MAX)
EMBEDMENT 2 1/4" (MIN)
3/4"(1/2") THREADED EXPOSED

STILL PLATE (BY OTHERS)
2x4 (MIN)

5000 psi CONCRETE,
FIBER REINFORCED,
AIR ENTRAINE

3 1/2' 1 lbs DENSITY EPS

DRAIN PIPE (BY OTHERS)
4" PERFORATED PIPE W/ FILTER MEMBRANE
TO DAYLIGHT OR SUMP LOCATION
2-2x4 PT BLOCKS 36' OC

CONCRETE FLOOR (BY OTHERS)
UNDER SLAB INSULATION (BY OTHERS)
5 1/2' CLEAN CRUSHED STONE UNDER SLAB (BY OTHERS)

GRAVEL SUB FOOTING (BY OTHERS)
6" (MIN) CLEAN CRUSHED 1/2" STONE

VIRGIN SOIL OR ENGINEERED FILL
MUST MEET 2000 PSI REQUIREMENTS

NOTE:
CONCRETE COMPRESSIVE STRENGTH 5000 psi (FIBER REINFORCED, AIR ENTRAINE)
AIR ENTRAINE RANGE: 4% - 7%
MAX LATERAL PRESSURE: 45 psf/ft of depth
ASSUMED SOIL BEARING PRESSURE: 2500 psf
STEEL YIELD STRENGTH: 60000psi

BUILD SMART

2017 - 0317 INSTALLATION MANUAL Copyright 2017 Build SMART
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CROSS SECTION OF IDEAL PRECAST FOUNDATION WALL AREAS WHERE THERE IS 12" OR LESS OF BACKFILL 4000 PLF MAXIMUM UNIFORM LOAD

ANCHOR BOLT 6 1/4" FROM FACE OF WALL 1/2" SIMPSON WEDGE-ALL OR EQUAL 36" O.C. (MAX)
EMBEDMENT 2 1/4" (MIN)
3/4" (+/- 1/2") THREAD EXPOSED

STILL PLATE (BY OTHERS)
2 x 4 MIN

3000 psi CONCRETE,
FIBER REINFORCED,
AIR ENTRAINED

3 1/2' 1 lbs DENSITY EPS

DRAIN PIPE (BY OTHERS)
4" PERFORATED PIPE W/ FILTER MEMBRANE TO DAYLIGHT OR SUMP LOCATION

CONCRETE FLOOR (BY OTHERS)
UNDER SLAB INSULATION (BY OTHERS)
5 1/2" CLEAN CRUSHED STONE UNDER SLAB (BY OTHERS)

VIRGIN SOIL OR ENGINEERED FILL MUST MEET 2000 PSF REQUIREMENTS
36" WIDE TRENCH AND GRAVEL SUB FOOTING (BY OTHERS)
6" (MIN) CLEAN CRUSHED 1/2" STONE
BOTTOM OF TRENCH MUST BE BELOW LOCAL FROST DEPTH

NOTE:
CONCRETE COMPRESSIVE STRENGTH 5000 psi (FIBER REINFORCED, AIR ENTRAINED)
AIR ENTRAINED RANGE: 4% - 7%
MAX LATERAL PRESSURE: 45 psf/ft of depth
ASSUMED SOIL BEARING PRESSURE: 2500 psf
STEEL YIELD STRENGTH: 60000 psi
June 1, 2015

Build Smart LLC
3741 Greenway Circle
Lawrence, KS 66046

Attn: Adam Cohen

Re: Building Code Compliance of Build Smart Exterior Wall Panel

Dear Adam:

We have examined the construction of the prototype Build Smart exterior wall panel with regard to compliance with building code requirements.

Discussion

There are two building codes under which buildings can be designed and built using Build Smart construction prototypes and techniques, the International Building Code (IBC) and the International Residential Code (IRC). IBC is a performance based building code which gives required design parameters such as live loads, wind pressures, seismic loads, etc., for which a building must be designed. It prescribes very few specific physical requirements such as floor joist sizes or basement wall thicknesses and reinforcement.

IRC, on the other hand, gives performance based design criteria as well but also prescribes the specific physical requirements of some elements such as rafters, floor joists, and basement walls, etc. Those elements not prescribed are designed according to the design specifications referred to by IRC and IBC.

Both codes, in their 2012 versions, contain a table which give minimum stud sizes and maximum stud spacings for various loading conditions. This table is Table R602.3(5) in IRC and Table 2308.9.1 in IBC.

Observations

The most common exterior wall construction used in this country utilizes vertical wood studs spaced at an uniform spacing, installed between a horizontal wood sill and a horizontal wood top plate. Sheathing of oriented strand board (OSB) is commonly used cover the outside of the stud/sill/plate assembly to complete the structurally performing part of the exterior wall element. The wall supports gravity loads from roof and floor construction above and transmits wind and seismic loading to receiving transverse elements of the building.
The most heavily loaded combination in Tables R602.3(5) and 2308.9.1 is that of two floors and a roof. We have chosen this combination for comparison purposes herein. Examination of the table reveals that it does not allow 2x4 studs for the "two floors & roof" combination but does list 2x6 studs spaced at 16 inches.

The Build Smart exterior wall prototype utilizes 2x4 engineered lumber studs at a 24 inch spacing to which is applied 7/16 inch OSB. The engineered lumber is "Lamco LFL" by Lamco Forest Products. However, also part of the assembly is a 5 1/2 inch thickness of expanded polystyrene (EPS) applied to the outside of the sheathing attached to the studs. A thickness of 7/16 inch OSB is then applied to the layer of EPS. So, at first, it appears that the Build Smart exterior wall assembly does not comply with Table R602.3(5) because it utilizes 2x4 studs, and at 24" spacing, for the "two floor & roof" load combination.

We have assessed the strength of the wall assembly expressed in the Tables for the following:
- Placement of two floors and a roof of a 50 foot wide building on the wall
- 110 mph wind speed
- 10' wall height
- Floor live load of 40 psf
- The use of Stud grade S-P-F stud and plate material (common practice)

Strength of dimension lumber wood components was assessed using the allowable stresses prescribed in the "National Design Specification for Wood Construction", 2005, American Forest and Paper Association, which is referred to by both IBC and IRC.

We find that the wall assembly given in the Tables utilizing 2x6 studs of dimension lumber spaced at 16", is valid. For the criteria given above this wall construction possesses a factor of safety of about 1.25.

We have also assessed the strength of the Build Smart exterior wall assembly, utilizing 2x4 engineered lumber studs spaced at 24", recognizing the presence of the thickness of EPS and second layer of OSB. Strength of the Lamco studs is given in a Technical Evaluation Report 1401-01 by DrJ Engineering. We find that it is also structurally adequate, possessing a much larger factor of safety relative to the performance requirements of the IBC and IRC. Its factor of safety is about 4.8, considerably more than the IRC assembly.

We have also assessed the Build Smart assembly utilizing 2x6 engineered studs spaced at 24". Its factor of safety is 5.5.

Conclusions

We find that both exterior wall assemblies, the conventional wood stud framed wall with 2x6 studs at 16 inch spacing, listed in the Tables, and the Build Smart assembly with 2x4 studs at 24 inch spacing, meet the requirements of both building codes.

Moreover, we find that the strength performance of the Build Smart wall assembly, with 2x4 engineered lumber studs at 24 inch spacing, significantly exceeds that of the conventional assembly with 2x6 studs spaced at 16" spacing when assessed for the combination of two floors and a roof.
IBC, in Paragraph 104.1, and IRC, in Paragraph R104.11, provide for the Building Official to recognize the adequacy of "materials and equipment" when building systems that, at first, appear to be non-compliant, are shown to equal or exceed systems prescribed in the building code when analyzed with rational analysis. Our structural analysis uses loads and material strengths prescribed by both building codes, using long established methods of structural mechanics; it should be considered "rational analysis". Consequently, the Build Smart exterior wall construction should be considered an acceptable alternative to the prescriptions of IRC Table R602.3(5) and IBC 2308.9.1.

Summarizing, the Build Smart exterior wall prototype construction, utilizing 2x4 or 2x6 studs of the Lamco engineered lumber material should be considered to be compliant with the International Building Code 2012 and the International Residential Code 2012.

Sincerely,

Ron Shiflett, PE
4. Load Path Engineering Letter

January 16, 2015

Build Smart
3741 Greenway Circle
Lawrence, KS 66046

Attn: Adam Cohen

Re: Build Smart Construction Questions

Dear Adam,

I understand that designers interested in utilizing your PassivHaus building systems have generated some questions regarding fastenings and load path through the structure. Consider the following:

In-Plane Lateral Load Transfer Within Wall Panels

Lateral loading is transferred within exterior wall panels by way of composite behavior between the OSB sheathing and the expanded plastic foam of the Passive Structures wall panels. Integral to the overall performance, of course, is the transfer of forces out of the sheathing into wood studs and top and bottom plates. To ensure this in areas for which the International Residential Code 2009 or 2012 establishes the design wind speed to be 100 mph or less, use this nailing schedule for 8d or 6d nails:

<table>
<thead>
<tr>
<th>OSB Panel Edges</th>
<th>At Intermediate Studs</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

In-Plane Lateral Load Transfer Between Wall Panels and Floor Framing

Exterior walls utilize edges of floor sheathing and ends of floor framing as part of the load path for transmitting lateral loads to the foundation. For areas listed in the International Residential Code to be associated with a design wind speed of 100 mph or less, transfer of these loads is assured by placement of 16d nails through bottom and top plates of wall panels, through floor sheathing, and into the ends of floor trusses. We have revised standard details 2 and 3 to show these nails.
In-Plane Lateral Load Transfer Between Wall Panels and Concrete Slab

Similarly, lateral loads are transferred to concrete slabs by way of ½” diameter expansion anchors placed through the bottom plates of wall panels into the concrete. This is shown in a revised detail 7.

In-Plane Uplift Load Transfer Between Wall Panels and Floor Framing

Transmission of uplift forces from roof trusses to the top plate of exterior wall panels, for design wind speeds of 100 mph or less, is accomplished by the placement of Simpson SDWC screws as shown in your standard detail.

For wind speeds of 100 mph or less there is negligible net uplift force between exterior wall panels and floor framing or concrete slabs due to the contribution of construction weight. The 16d nails between wall panels and floor framing and the expansion anchors between panel bottoms and concrete slabs will suffice.

Design Wind Speed Greater than 100 Mph

Where the design wind speed in an area exceeds 100 mph the connections discussed herein must be examined on a case-by-case basis.

Sincerely,

Ron Shiflett, PE

COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
March 7, 2017

Build SMART
3741 Greenway Circle
Lawrence, KS 66046

Attn: Rob Leonard

Re: Attachment of BuildSMART Nailbase Panels

Dear Rob:

For your BuildSMART Nailbase Panels we have examined the necessary attachment of these based on the panels being attached to vertical wood studs using No. 9 wood screws. Screws engage the OSB or Zip Wall sheathing of the panels. The attachment schedule is as follows:

### Screw Spacing Through Gable Panels into Vertical Stud

<table>
<thead>
<tr>
<th>Stud Spacing</th>
<th>16&quot;</th>
<th>24&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBC Vult mph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 115 mph</td>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>115 to 150 mph</td>
<td>9&quot;</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

Let me know if you have any questions

Sincerely,

Ron Shiflett, PE
6. Bottom Chord Bearing Floor Truss to Wall

**WOOD FLOOR TRUSS**
PERPENDICULAR TO WALL

**WOOD FLOOR TRUSS**
PARALLEL TO WALL
SUITABLE FOR TRUSS DEPTHS ≤ 12'
7. Top Chord Bearing Floor Truss to Wall

- Top Chord Bearing Wood Floor Truss Perpendicular to Wall

- Top Chord Bearing Wood Floor Truss Parallel to Wall

CLIENT: IDEAL PRECAST
PO BOX 61219
DURHAM, NC 27715
8. Deck Framing to Exterior Wall

**TYPICAL ATTACHMENT – DECK FRAMING TO EXTERIOR WALL**

1" = 1'-0"
TYPICAL ATTACHMENT — DECK FRAMING TO EXTERIOR WALL

1 - 1 - 0

10" x 8", 16GA GALVANIZED STEEL PLATE AT EACH JOIST W/ 8 - No. 9 SCREWS INTO OUTSIDE FACE OSB OF S.I.P.; APPLY CONSTRUCTION ADHESIVE TO PLATE / OSB INTERFACE.

2X6 ANCHOR BLOCKING W/ 2 - ⅛" GRK "RSS" SCREWS @ EACH JOIST PLATE

METAL JOIST HANGER, SIMPSON SERIES "LUS___", OR EQUAL W/ 6 - No. 10 SELF DRILLING SCREWS INTO STEEL PLATE.
9. Standard Wall Header

NOTES

GROUND SNOW LOAD: 30 PSF
FLOOR LIVE LOAD: 40 PSF
ROOF DEAD LOAD: 13 PSF
FLOOR DEAD LOAD: 12 PSF

STANDARD HEADER: 2 - 2X10
NO. 2 SOUTHERN PINE W/ 1/2" EPS

P.O. Box 12082
Roanoke, VA 24022
(540) 945-5558
Email: info@covenanteng.com

Standard Wall Header

Figure 1

Prepared: R. Shiflet
Date: July 7, 2014
10. Insulated Wall Panel to Floor Framing Attachment

![Diagram of Insulated Wall Panel to Floor Framing Attachment]

**TYPICAL ATTACHMENT – INSULATED WALL PANEL TO FLOOR FRAMING**

1" = 1'-0"
TYPICAL ATTACHMENT - INSULATED WALL PANEL TO FLOOR FRAMING

1" = 1'-0"
Technical Bulletin

Design and Construction of Frost-Protected Shallow Foundations (American Society of Civil Engineers Standard 32-01)

Executive Summary

Both the International Residential Code and the International Building Code provide that the foundation frost protection requirement may be met by construction in accordance with ASCE 32. The Standard addresses the design and construction of frost-protected shallow foundations in areas subject to seasonal ground freezing. Foundation insulation requirements to protect heated and unheated buildings from frost heave are presented in easy-to-follow steps with reference to design tables, climate maps, and other necessary data to furnish a complete frost-protection design. The advantages of this technology include improved construction efficiency over conventional practices, increased energy efficiency, minimized site disturbance, and enhanced frost protection. A commentary is included to provide background information and important technical insights. Many articles have been written supporting its use. Here is the Table of Contents:

Chapter 1 Scope and Limitations
Chapter 2 References
Chapter 3 Symbols, Units, and Definitions
Chapter 4 Design Principles
Chapter 5 Simplified FPSF Design Method for Heated Buildings with Slab-On-Ground Foundations
Chapter 6 FPSF Design Method for Heated Buildings
Chapter 7 FPSF Design Method for Unheated Buildings
Chapter 8 Special Design Conditions for FPSF
Appendix A Design Data
Commentary

The index is here: [http://ascelibrary.org/doi/pdf/10.1061/9780784405542.in](http://ascelibrary.org/doi/pdf/10.1061/9780784405542.in)

Code Provisions

International Residential Code
R403.1.4.1 Frost protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:
1. Extended below the frost line specified in Table R301.2. (1).
2. Constructed in accordance with Section R403.3.
3. Constructed in accordance with ASCE 32.
4. Erected on solid rock.

International Building Code
1809.5 Frost protection.
Except where otherwise protected from frost, foundations and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:
1. Extending below the frost line of the locality; locality.
2. Constructing in accordance with ASCE 32.
3. Erecting on solid rock.

List of Articles

www.concreteconstruction.net/foundation/frost-protected-shallow-foundations-reduce-costs-save-energy_o.aspx
www.khpc.com/portals/0/pdfs/news%20publications/bottom%20of%20the%20envelope.pdf