



INSTALLATION GUIDE

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INSTALLATION GUIDE FOR FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

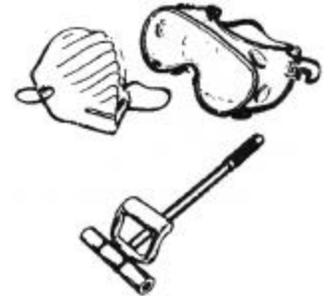
PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING INSTALLATION

These guidelines are provided in good faith to help prevent installation problems caused by common errors. The manufacturer and/or distributor of the product bears no responsibility for installation actions taken or not taken. There are many nuances of installation that are assumed to be general construction knowledge to an experienced installer; such nuances are not included in these instructions. Rather, these installation guidelines are strictly recommendations and are not intended to serve as a step-by-step, foolproof installation checklist. Selection of an experienced frp installer is the sole responsibility of the project owner and architect. If you have any questions about installation techniques for your particular project, please call the Sales Office listed on the front of this installation guide and ask for an Office Sales Representative.

WHEN CUTTING OR DRILLING FRP PANELS, ALWAYS WEAR PROTECTIVE GLASSES OR GOGGLES AND A MASK THAT COVERS THE FACE AND MOUTH. Skin irritation due to glass fibers may be avoided by applying a barrier cream to exposed skin areas prior to working with frp panels.

➤ **TOOLS NEEDED**

Frp panels may be cut most efficiently using a fine-tooth saw blade. Swivel-head shears may be needed for small cutouts or trimming. Use a diamond-coated or carbide drill bit to pre-drill fastener holes. If installing with an adhesive, use a trowel with the notch pattern recommended by the adhesive manufacturer. A laminate roller should be used to obtain maximum contact between panels, adhesive, and substrate.



➤ **MATERIALS NEEDED** - *Review Wall Conditions section to determine appropriate fastening method.*

Frp Panels
Frp Latex-Based Adhesive
Nylon Drive Rivets or Non-Corroding Fasteners
PVC Moldings
Silicone Sealant
Soap & Water for Clean-up
Mineral Spirits for Clean-up

➤ **STORAGE**

Store panels on the original shipping pallet in a dry environment. Do not store other materials on top of the frp panels. Do not store directly on concrete or any other surface that emits moisture. Lay panels flat. Do not stand panels on edge. **Store all frp panel products inside.**

➤ **INSPECTION**

Every attempt is made to inspect panels for cosmetic and physical abnormalities prior to shipment, however all panels should be inspected for any defects prior to installation. Do not install panels of unacceptable or questionable quality. Kemlite Company, Inc. will not be responsible for installation or removal costs of unacceptable panels.



Acclimate Panels for 24 hours in room operating conditions.

➤ **BEFORE INSTALLATION**

Frp panels, with the shipping materials and banding removed, should be allowed to acclimate to room temperature. Lay panels flat on a solid, level, dry surface. Do not store directly on concrete or any other surface that emits moisture. All frp panels will expand and contract during temperature and humidity changes. Allowing the panels to acclimate to the anticipated operating room temperature and humidity conditions prior to and during installation will help ensure a successful installation. Installing frp panels after the HVAC systems are in place and operational is recommended.

WALL PANEL PREPARATION

Walls should be flat and even. Remove high spots and fill in low spots prior to beginning installation. Remove wallpaper, soluble or loose paint, and other foreign matter that may interfere with the adhesive bond. The wall substrate must be dry and free from dirt, dust, and grease.

The following **WALL CONDITIONS** require additional preparation or installation techniques:

➤ **UNEVEN SURFACES**

Installation over uneven surfaces will result in less than complete adhesion to the wall substrate, therefore creating the potential for air pockets to form behind the panel. High and low spots should be leveled to provide an even wall surface.

➤ **NEW GYPSUM BOARD OR DRYWALL**

Remove all drywall dust. Tapered joints need only a fill and taped coating. A finish coat is not necessary or desirable. In addition, any extremely uneven areas should be filled.

➤ **PLYWOOD**

Plywood walls should be dry and even. Warped plywood should be removed and replaced.

➤ **PAINTED SURFACES**

Remove loose paint. Adhesive will bond only to the contacting surface, so make certain that any painted areas are sufficiently cured and the paint is firmly adhered to the substrate. It may be necessary to use rivets as well as adhesive to provide adequate bond strength.

➤ **HIGH HUMIDITY ROOMS**

Acclimate panels in the operating humidity conditions. Carefully follow the guidelines in this installation guide for expansion/contraction spacing and sealing. Use an adhesive that is recommended for high humidity conditions. Follow the adhesive manufacturer's installation recommendations carefully. A vapor barrier (e.g. 6 mil poly sheet) may be required. Follow the architect or owner's specifications or check your local building codes for specific requirements.

➤ **LOW TEMPERATURE CONDITIONS**

Carefully follow the guidelines in this installation guide for expansion/contraction spacing and sealing. Use an adhesive that is recommended for low temperature conditions. Follow the adhesive manufacturer's installation recommendations carefully. A vapor barrier (e.g., 6 mil poly sheet) may be required. Follow the architect or owner's specifications or check your local building codes for specific requirements.

➤ **CONCRETE BLOCK AND BRICK**

Concrete block and brick wall surfaces are by nature uneven, and frp panels installed directly to these surfaces will likely develop loose spots, bulges and buckles. If a smooth-buckle free wall surface is

required, the wall should be furred out with wood or metal studs or channels and covered with factory laminated panels.

An alternate method is to install gypsum board, cement board or another appropriate substrate over the furring and then install frp panels according to the standard installation instructions. If it is the owner or contractor's preference to install frp panels directly to a concrete block or brick wall, it is recommended that the panels be installed with nylon drive rivets alone, without any adhesive. The rivet holes must be oversized and expansion joints provided. This will allow the panels to expand and contract under the rivet heads and will minimize but not eliminate buckles in the panels.

➤ **FOAM INSULATION**

An approved thermal barrier system (e.g., gypsum board) must be used between the frp panels and any foam insulation (figure 1). Check your local building codes for specific requirements

➤ **NON-POROUS SURFACES**

Non-porous surfaces (e.g., ceramic tile, glazed block, and metal panels) do not provide a good surface for adhesive bonding. Rivets are recommended for all installations over non-porous surfaces. If adhesive in addition to rivets is used, consult the adhesive supplier for product recommendations; a general-purpose latex-based frp adhesive will not cure properly on non-porous surfaces.

➤ **NEAR HEAT SOURCE**

Frp panels may discolor when installed behind or near a heat source which radiates temperatures exceeding 130°F (55°C), such as cookers, ovens, and deep fryers. Stainless steel is recommended for these types of areas.

➤ **CAR WASHES**

See the last page in this installation guide for specific instructions.

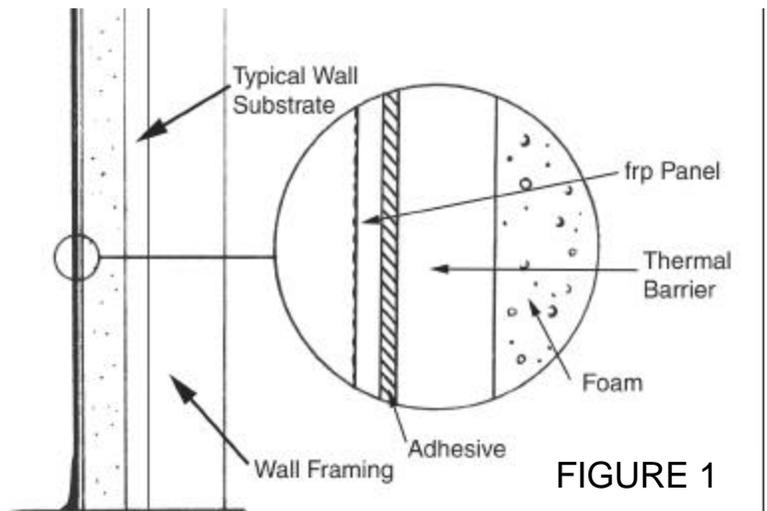


FIGURE 1

STANDARD WALL PANEL INSTALLATION INSTRUCTIONS

Generally, frp panels can be installed using adhesive alone, fasteners alone, or a combination of adhesive and fasteners. The method used should be determined by the room and wall conditions (see the wall conditions noted above). Check your local building codes for any restrictions or guidelines regarding approved installation methods.

➤ **ADHESIVE**

If adhesive is used, be sure that it is an frp-formulated product. Frp adhesives are widely available. Follow the adhesive manufacturer's recommendations for trowel style (e.g., appropriate height of adhesive bead left by trowel). It is important to apply adhesive carefully and follow all directions to prevent problems that may result from using too little or too much adhesive. 100% adhesive coverage is recommended using a "crosshatch" pattern. Adhesive should extend to all edges of the panel and should be applied directly to the back of each individual frp panel.

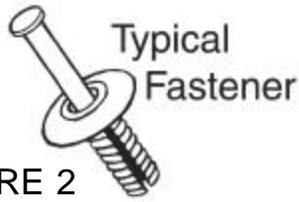
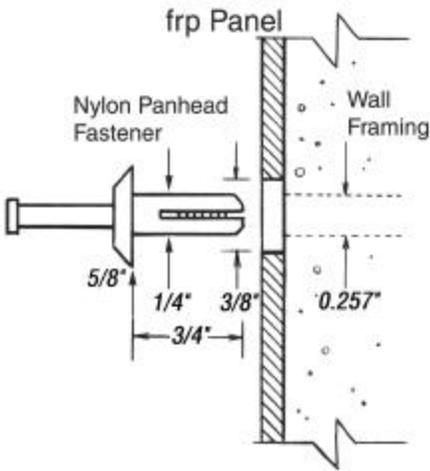


FIGURE 2



➤ **FASTENERS**

Nylon drive rivets, or corrosion resistant screws are appropriate fastener options. If rivets or fasteners are used, panels should be predrilled using a drill bit that is 1/8" to 1/4" larger than the fastener. During installation, holes only slightly larger than the fastener should be drilled into the substrate through the predrilled holes in the panel and prior to any adhesive application (figure 2). Apply silicone sealant prior to inserting rivets or fasteners.

The recommended fastening frequency is 16" on center both horizontally and vertically. Space perimeter holes at least 1" to 1-1/2" from panel edge when using one piece moldings and stagger holes of abutting panels. When using two piece moldings put perimeter holes 1-1/2" to 2" away from panel edge (figure 3).

➤ **SPACING**

All frp panels have expansion characteristics due to changes in

humidity and temperature that must be accounted for during installation with proper spacing around panel edges and around fixtures attached to the panel/wall. Adequate space must be allowed for panel expansion and contraction. For a 4' x 8' panel, a minimum gap of 1/4" is required at the top and bottom of each panel and 1/8" between panels (figure 4). More room will be required for longer panels. It is recommended that panels do not exceed 48" in width and 12' in length to aid in ease of installation and ensure a satisfactory finished installation. See the frp panel Expansion Joint Chart for appropriate spacing at ceiling, floor and between panels.

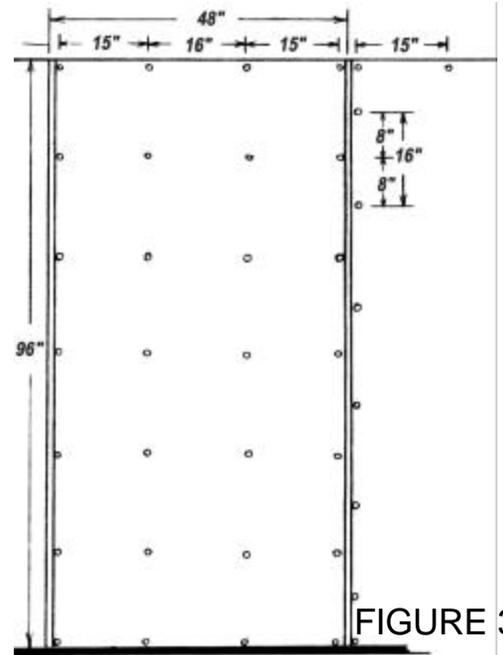


FIGURE 3

EXPANSION JOINT CHART

PANEL SIZE	4x8	4x9	4x10	4x12
Gap at ceiling	1/4"	1/4"	3/8"	3/8"
Gap at floor	1/4"	1/4"	3/8"	3/8"
Gap between panel and center of 1 piece molding	1/8"	1/8"	3/16"	3/16"
Gap between panel and center of 2 piece molding	1/4"	1/4"	3/8"	3/8"
Gap between panel when not using molding	1/4"	1/4"	3/8"	3/8"
Gap around rivets	1/8"	1/8"	3/16"	3/16"
Gap between panels and wall fixtures	1/8"	1/8"	1/4"	1/4"

Installation of panels over 12 feet long is not recommended.

➤ **MOLDINGS**

One-piece or two-piece moldings are available for installation with standard frp wall panels. Panels are inserted into the one-piece molding opening, while both parts of the two piece molding are installed on top of the panel. Panels beneath the two-piece molding should maintain the recommended expansion spacing.

Installations requiring additional abuse resistance should use the heavy-duty corners and batten strip.

STEP 1 - PLANNING AND CUTTING

- Pre-fit each panel before fastening and/or adhering in place.
- All cutting and drilling should be done prior to the application of adhesive.
- Rivet holes should be predrilled in the panels using a bit that is 1/8"-1/4" larger than the rivet. Plan ahead so that fasteners will not interfere with moldings or other wall fixtures.
- Preplan for cove or base molding. Frp panels should be installed so that the base molding will not restrict normal panel movement during expansion and contraction. Cut panels 1/4" short of where the base molding will extend; poured molding should be in place prior to installation (figure 4).

STEP 2 - ATTACHING TO WALL

- Begin installation in a corner. Mark a plumb line 48-1/8" from the corner. In areas where several courses of panels are used (e.g., on a high wall), use vertical and horizontal lines to assure alignment.
- Install one piece of corner molding. Apply silicone sealant in molding groove.
- If using rivets - drill holes into the substrate through the predrilled holes in panel.
- If using adhesive - apply adhesive to panel using adhesive manufacturer's recommended trowel height to ensure good adhesion.

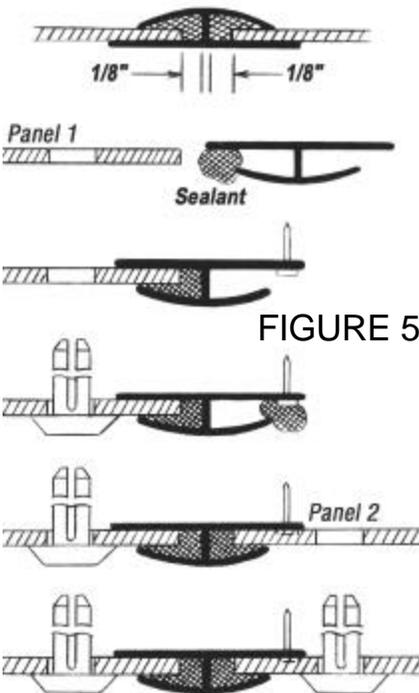


FIGURE 5

- Always put silicone sealant in all molding and around all panel edges, fasteners, and fixtures to provide a moisture-proof installation.

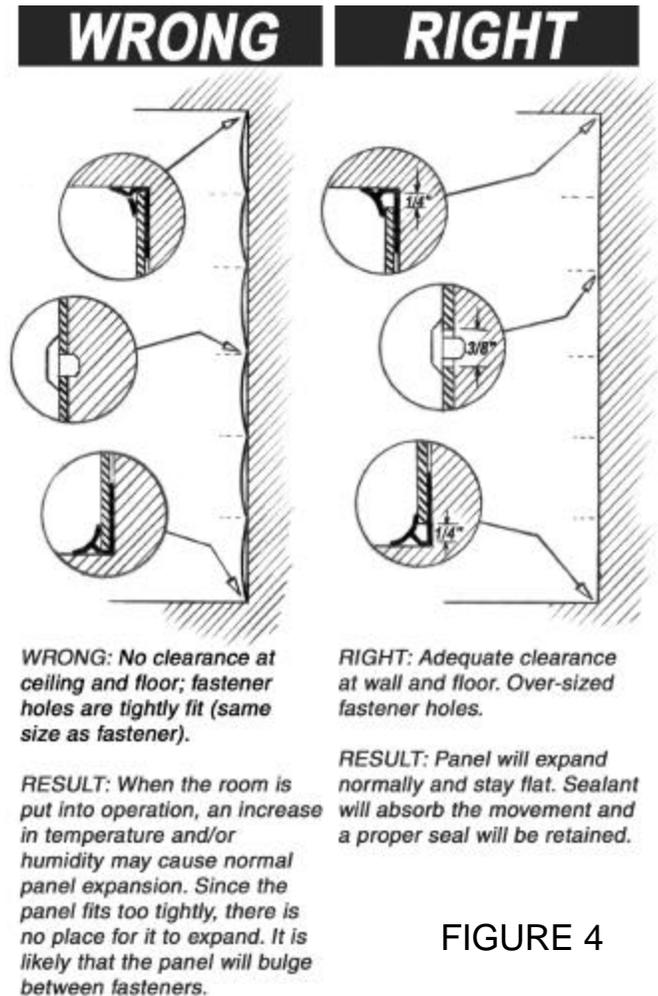


FIGURE 4

- Set the first panel true with the plumb line.
- If using adhesive for installation, roll panel with a laminate roller, beginning at the top corner nearest the molding and rolling down and out towards the edge away from the molding, making certain to remove all trapped air. This will aid in removing air pockets and will help to ensure a flat, fully adhered installation.
- Install fasteners as each panel is put into place and before the next division bar or molding strip is applied. Start fastening at top edge with installed molding and work toward the other side. Continue installing fasteners one row at a time until fastening is complete. Apply silicone sealant beneath rivet or fastener.
- Install one-piece division bar and caps or next molding piece by laying down a bead of silicone in molding groove and sliding completely onto the panel. Withdraw the molding or division bar 1/8" to provide proper spacing (see figure 5). The free edge of the molding or division bar may be tacked in place if preferred before installing the next panel.
- Repeat the process, working in one direction around the room.
- If fasteners are not used, a few nails may be used at the top (above the ceiling grid line) to help hold panels in place while the adhesive cures. Once the adhesive has cured, however, these nails must be removed, as they do not allow for normal panel expansion and contraction.

STEP 3 - PANEL INSTALLATION FINISHING

- Silicone sealant should be applied in all molding and around all panel edges, fasteners, and fixtures to provide a moisture-proof installation.
- Adhesive residue should be removed immediately.
- Latex-based adhesive can be removed with soap and water.
- Solvent-based adhesive may be removed with mineral spirits.
- Adhesive residue may make panels appear stained and will collect dirt. Clean panels thoroughly prior to leaving the jobsite.

CEILING PANEL INSTALLATION INSTRUCTIONS

➤ LAY-IN CEILINGS

For lay-in ceiling grid systems, in order to avoid unacceptable deflection, purchase factory pre-cut ceiling panels. Wall panels may be more flexible than ceiling panels and should not be cut into ceiling panel sizes (2' x 2' or 2' x 4') at the jobsite.

To install ceiling panels, lay into ceiling grid. Trim as necessary to accommodate lighting or other fixtures. Always leave a 1/8" gap between panel and grid or fixture to allow for normal panel expansion and contraction.

Frp grid systems may require specially sized ceiling panels. See the frp grid system installation guide.

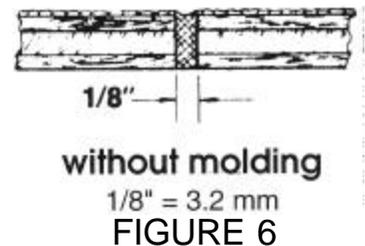
➤ GLUE-UP CEILINGS

To glue up and rivet full-size panels to a solid ceiling substrate, follow the instructions for wall panel installation. To ease handling, panel size should be limited to 4' x 8'. Mechanical fasteners should always be used on ceiling installations.

FACTORY LAMINATED PANEL INSTALLATION INSTRUCTIONS

Laminated panels may be installed following the frp panel installation instructions. Laminated panels are commonly installed directly over a steel or wood studded wall. Stud spacing is recommended to be 16" or less on center. Stud spacing should be planned so that panel edges will occur on stud centers. Laminated panels should not be installed over C-Channel aluminum studs, as the aluminum may not be strong enough to resist any movement in the paneling should expansion or contraction occur.

- Use same spacing guide for panels and fasteners as listed in frp panel installation recommendations.
- Laminated panels may be installed without a division bar molding, but maintain a 1/8" space between panels. This space allows for normal expansion and should be filled with silicone sealant to completely seal the installation from moisture (Figure 6).
- Always seal around any moldings, fixtures or fasteners to provide moisture proof installation.
- Laminated panels may be fastened with non-corroding nails or screws directly to wood or steel studs (minimum 25 GA.) or with nylon drive rivets to drywall, plaster, or concrete block. Install fasteners no further than 8" apart around outside edges and 12" apart on intermediate 16" centers.
- Put perimeter fastener holes 1/2" to 2" from panel edge depending upon width of molding being used.
- Fastener holes in the panel should be predrilled 1/8" larger than rivets.





- One piece molding is available for use with standard 9/32" OSB laminated panels.
- Two piece molding or heavy-duty batten strip and corners are available for non-standard thickness (Figure 7). See your frp panel distributor for availability.
- Silicone sealant should be applied in all moldings and around all panel edges, fasteners, and fixtures to provide moisture proof installation.

CAR WASH INSTALLATION INSTRUCTIONS

Using frp panels that have been factory laminated to fluted polypropylene is the ideal solution for lining the interior walls of a car wash, with its high moisture environment. The expansion and contraction due to thermal changes and extended exposure to moisture can, however, cause any frp panel product to expand. Bulging from expansion can be minimized if panels are installed properly. The key to a satisfactory installation in such a high moisture environment is to provide adequate clearance around fasteners, moldings, pipes, and junctures so the panels are free to expand and contract. As little as 1/64" change in length can cause bulging if there is no clearance for a panel to expand. NOTE: Bulging of panels in a car wash installation is not cause to consider the panels defective. In general, follow the wall panel installation instructions within this guide. Additionally, the following guidelines will aid in completing a satisfactory high moisture installation.

1. Limit panel lengths to 8 ft.
2. Install panels vertically.
3. Acclimate panels to the ambient temperature and moisture conditions for a minimum of 24 hours prior to installation.
4. Install panels leaving a minimum of 1" space at both the floor and ceiling junctures.
5. Use mechanical fasteners (metal or nylon drive rivets). Always oversize the fastener holes. Do not use adhesive.
6. Install wall-hung equipment and signs with standoffs (washers) between the substrate wall and equipment, making certain that the standoffs are thick enough to expand and contract. Drill panels 1/4" diameter larger than the standoffs (see figure 8).
8. Caulk and seal all edges to keep water from getting behind the panels.

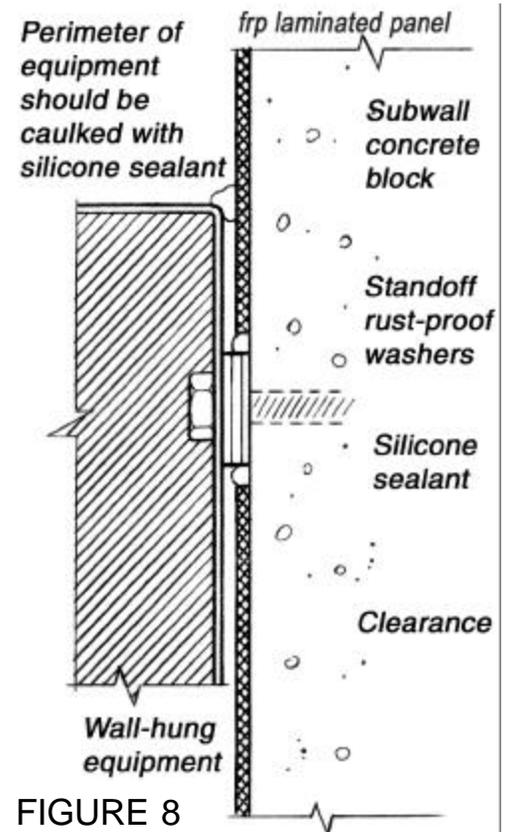


FIGURE 8

FACTORY MUTUAL APPROVAL

The only frp panel that is Factory Mutual Approved is Fire-X Glasbord® FM by Kemlite Company, Inc. To meet FM compliance, the panels must always be installed with mechanical fasteners and no adhesive. See FM report J.I. No. 2B2A2.AM dated 12/20/99.