

General

Custom Rock Elastomeric formliners are ideal for tilt-up, cast-in-place, or precast architectural concrete.

- To insure proper use and installation, all personnel working with Custom Rock elastomeric formliners should read this application guide and become familiar with its content.
- Please note that manufacturing tolerances of formliner are +/- .25”.

Handling and Care

- Custom Rock elastomeric formliners are shipped on pallets approximately 4’ wide by 8’ long. Proper equipment should be used when moving pallets to avoid personal injury or damage to the product.
- Custom Rock elastomeric formliners are sensitive to the effects of the sunlight, ultraviolet rays, moisture, and extreme weather conditions. Store off ground and either indoors or covered with a tarpaulin or black plastic to protect the forming surfaces whenever it is not in use. This will prolong the life of the formliner material and keep the forming surfaces clean.
- Custom Rock elastomeric formliners should never be exposed to temperatures in excess of 150 degrees Fahrenheit. Excessive temperatures can cause permanent deformation and in some cases, cause discoloration of the concrete surface.
- Once attached to formwork, formliners should be stored on edge to prevent damage to the liners. Care should be taken to avoid striking the face with heavy, sharp or heated objects that could cause permanent damage.
- Do not immerse formliner in liquid of any kind.

Form Placement

- It is most important that forms for architectural concrete be aligned and in common planes. A “stack-up” of manufacturing tolerances can result in forms being in different planes. This creates a noticeable “step” in the finished surface, particularly with shallow Formliner patterns.
- All formwork should be sufficiently rigid to remain sealed during concrete placement and vibration.
- Seal all joints and tie holes by caulking or the use of gaskets to prevent grout leakage.
- Do not “lap” formwork over previous pours that have uneven architectural surfaces. Such lapping will result in a form offset with leakage that distorts the finished concrete appearance.
- Further recommendations are contained in ACI 347-01.

Tie Placement

- To minimize the visual effect in the finished surface, plan formwork so tie placement is at rustications, reveals, or other inconspicuous locations. Remember to allow for the depth of the formliner when calculating the breakback requirement for ties.
- When using a rib pattern formliner, locate ties at the high point of the formliner rib. This places the tie in the recess of the finished surface where it is less noticeable. The maximum diameter of the tie (cone, She- Bolt, Taper Tie) should not exceed the minimum width of the rib.
- Provide a minimum of 1” concrete cover for ties requiring breakback.
- If cones are used, the diameter of the cone should be less than its depth to facilitate patching.

Formliner Joints

- It is very difficult to match pattern features at joints and ensure the surface appears continuous. Slight differences in shape, thickness, and texture will have a visible impact on the finished surface. For this reason, avoid or minimize both vertical and horizontal joints. Patching, sacking, grinding, and coloration, when done properly, provide an excellent way to greatly minimize any seams or joints.
- When joints are unavoidable, make the joint along the main features of the pattern. Match pattern features carefully, and minimize grout leakage at the joint with caulking or foam tape. This practice will help reduce the visible effect on the finished surface.
- Consider the pattern dimensions to achieve an overall balanced design. It is especially important to consider pattern dimensions when planning for unavoidable joints, boxouts and corners in the finished surface.

Rustication

- Rustications or reveal strips are recommended at formliner butt joints. This not only accentuates the pattern, but also eliminates the need to produce a perfect pattern joint. This can be especially useful when trying to align ribbed and vertical patterns, as these types of patterns combined with the normal formliner manufacturing tolerances of +/- .25" create a challenge to align everything.
- It is recommended that rustication be applied as a closure on the top of a pattern and sealed with foam tape.

Boxouts

- There are two methods of forming boxouts: (1) permanently modifying the formliner, and (2) applying a closure to the face of the formliner.
 1. Boxouts by modification require that the formliners be cut to accommodate the boxouts. The location of the pattern features should be determined before fabricating the required boxouts.
 2. Boxouts by closure do not require that the formliners be cut. The required boxouts are placed over the formliner, and materials such as caulking or foam tape are used to fill the voids between the boxouts and the formliner surface. The materials used are dependent on the configuration of the formliners and the concrete pressures. Access through the boxout should be considered when box out exceeds 2' in width.

Corners

- There are two methods of forming corners: (1) permanently modifying the formliner, and (2) applying a closure to the face of the formliner.
 1. Corners by modification require that the formliners be mitered to accommodate the corners. The location of the pattern features should be determined before mitering the required corners.
 2. Corners by closure do not require that the formliners be cut. A smooth reveal is used at inside or outside corners to simplify corner formwork construction and minimize pattern misalignment at the corners.

Reinforcing Steel

- Locate reinforcing steel accurately to ensure proper cover and eliminate rust stains on the finished concrete surface. The clear distance between the outermost reinforcing bar and the surface should be at least 1 1/2" for urethane formliner. Remember to allow for the thickness of the formliner pattern when calculating the proper cover for the reinforcing steel.
- Provide a minimum of 5"x5" clear opening in reinforcing steel throughout, for proper placement and vibration of concrete. Use maximum diameters in calculating steel spacing and clear openings. These placement and vibration openings should be consistent with the capabilities of the vibration equipment. Further recommendations are contained in ACI 309- 92.

Test Pour

- Before actual construction, a test pour is recommended to demonstrate the results on the finished concrete surface.
- The test pour should simulate as many phases of the actual construction as possible and include typical tie holes, boxouts, corners, reveals, wall intersections and joints.
- The test pour should be the height of the maximum wall to be produced.
- Upon approval, the actual construction should proceed using the same methods and materials to assure uniformity throughout the entire project.

Sealing

- All formliner joints and tie holes should be sealed to prevent localized water loss and subsequent discoloration of the concrete. It is important that the formliner is contained on all sides so that concrete cannot move under it. Any leakage will make stripping difficult and may damage the formliner.

Attachment to Formwork

Custom Rock formliners require the use of formwork to back up liners and support concrete. Formliners must not be used without formwork.

1. Assemble and brace the architectural side of the formwork first. Attach the formliner before setting ties or opposite formwork.
2. Position the formliner against the formwork so that edges, pattern, and joints are square. Work with one liner at a time.
3. Elastomeric formliners can be attached to the forms from the front or back of the form with bolts or lag screws. The head of the bolt can be screwed into the face of the liner and covered with a silicon or urethane caulking material.
4. Should joints be required, compress the joint as tightly as possible, without buckling or distorting the pattern. Seal all joints by caulking or gasketing to prevent grout joint leakage.
5. Dress the joints and edges with a utility knife or sander to match pattern features as closely as possible
6. Cover the formliner when it is not in use to prolong the life of the material and pattern.

Materials and Tools

The quantity of materials and tools will vary with the size of the project and the method of attachment
Materials:

- Wood tack strips
- 2" x 4" lumber
- Box nails (6d) and finishing nails (#6)
- Disposable one gallon mixing containers
- Mixing sticks
- Adhesive
- Methylene chloride cleaning solvent
- Cotton rags
- Foam tape for voids and modifications
- Silicone caulking for voids and modifications
- Sanding disks, #36 or #24 grit
- Clean Strip™ J1A or Magic Kote® form release
- Paint brush with natural bristles
- Deck brush with natural bristles

Tools:

- Tape measure
- Chalk line
- Utility knife
- Power rotary rasp
- Saber saw with knife blade
- Power sander or grinder
- Hammer
- Electric drill with hole saw
- Measuring cup
- Serrated trowel (1/16")
- Sprayer with wand extension
- Personal safety equipment

Cutting and drilling

- Custom Rock Elastomeric formliners may need to be cut, modified or drilled to fit the formwork and conditions found on many architectural concrete projects.
- For cutting formliners, a cross-cut hand saw, saber saw with knife blade, or utility knife may be used. For drilling, a cylinder type hole saw can be used.
- If using power equipment, slower speed settings are preferable, as high heat can cause the formliner to melt. Lubricating the blade or bit with WD-40 during the trimming process may help to keep friction/heat to a minimum.
- While cutting, trimming, or drilling, formliners should be securely clamped to a work bench and a cutting guide should be used.
- If a formliner butts against a chamfer or reveal strip, miter the edge of the formliner on the same angle for proper fit.
- The rough edges created by cutting and drilling can be dressed with a sander. Remember to remove all dust and debris from the surface.
- Formliners should be trimmed, cut and installed at about the same ambient temperature as expected during placement of concrete, preferably during the coolest part of the day.

CAUTION: Sanding, cutting and drilling can create dust and other particulate that may be inhaled. Long-term exposure to this dust may be harmful, and workers should always wear appropriate safety equipment.

Form Release

- Custom Rock recommends Cresset Crete-lease 880 or 880 VOC for VOC compliant applications
- Formliners should be sprayed with a form release before each use and within the same day, as close as possible, of the concrete placement time.
- A form release sprayer should be used and the spraying angle varied to insure complete coverage of all pattern featured.
- For best results, the formliner should be cleaned before spraying with form release and after each use.
- Solvent and petroleum-based form releases will degrade plastic formliners and are not recommended for use with Custom Rock formliners.

Placing Concrete

- Architectural concrete requires mix designs that provide maximum workability consistent with strength requirements. A workable mix combined with proper vibration will reduce the risk of air bubbles, honeycombing and surface blemishes.
- Inspect forms and formliner to make sure all joints are sealed. Remove any dirt, debris or standing water prior to placing concrete.
- Use an elephant trunk or tremie for placing concrete to minimize aggregate separation, splatter and trapped air. Dropping the concrete directly against the formliner may cause surface abrasion or deformation and result in a defect in the finished concrete. Some formliners can withstand very heavy form pressures, but most cannot withstand a rate of pour in excess of 4 to 5 feet per hour. Generally, the more texture or relief on the formliner, the slower the concrete must be placed. If a plasticizer is used, the rate of pour may have to be reduced to limit form pressure. Place architectural concrete in two foot continuous lifts and do not move concrete horizontally. If horizontal movement is employed, flow lines and sand streaking will be evident in the finished surface. Do not stop concrete placement part way up the pattern; the resulting cold joint will be very apparent in the finished surface.
- Internal vibration is the most common method of consolidated architectural concrete. Proper vibration will reduce air voids, lift lines and surface blemishes. To avoid damage, do not allow vibrator to contact the formliner. Follow ACI recommendations for the vibration of concrete.
- In tilt-up wall applications, place concrete onto the formliner from the center, moving the concrete towards the outside perimeter with rakes. Do not allow concrete to be pushed under the formliner.

Stripping

- Formliners must be stripped within 24 hours of placing concrete. Tilt-up panels should not be lifted until the concrete has reached the specified concrete compressive strength.
- To avoid variations in concrete color, it is important to maintain consistency from time of placing concrete to time of stripping throughout the entire project.
- Formwork should be stripped at 90-degree angles to the concrete surface if possible. The force required in stripping forms with architectural formliners is greater than smooth formwork. When applying the extra force needed, care should be taken so that the textured surfaces and formliners are not damaged. High profile patterns are harder to strip than low profile patterns.

Cleaning

Custom Rock Elastomeric formliners are easily cleaned with household detergent and a stiff brush.

Warranty

Custom Rock warrants that formliner will be free from defects in workmanship or materials for a period of ninety (90) days from the date of shipment. Customer is responsible for inspecting products for defects. ***If a potential defect is found, Customer must photographically document the defect and promptly notify Custom Rock in writing of any nonconformity.*** The sole and exclusive remedy is limited to the replacement or repair of the defective product, at Custom Rock's sole discretion. This warranty is void if formliner is altered in any way, including cutting or puncturing, or handled or used in a manner inconsistent with Custom Rock's written specifications or Field Service Bulletins, as issued from time to time.

EXCEPT AS SET FORTH ABOVE, CUSTOM ROCK MAKES NO WARRANTIES AS TO ANY GOODS, PRODUCTS, OR SERVICES, AND EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR WARRANTIES ARISING FROM THE COURSE OF DEALINGS OR USAGE OF TRADE.