

System Application Guideline

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INTRODUCTION

This Application Guideline has been published to ensure proper use and installation of **Fitzgerald Formliners** GrayLastic products. It is recommended that all personnel involved with the use of **Fitzgerald Formliners** GrayLastic products read this Application Guideline.

GrayLastic formliners are made from a two-component urethane formulation and are factory mold bonded to 0.75" plywood in a one-step process. Mold bonding is a more durable method than simply gluing to plywood. Standard liners are typically available in 4' widths with lengths up to 24' or more, depending on the pattern. GrayLastic formliners are ideal for cast-in-place or precast applications where 20 to 100 pours are required of the liner material.

CARE AND HANDLING

When not in use, formliners should be protected from moisture and sunlight by being elevated off the ground and covered with a tarpaulin. Most materials degrade when exposed to intense sunlight for extended periods of time. Degradation will affect the life of the liner, and in some cases, cause discoloration of the concrete surface.

In addition, a surface temperature in excess of 190° F may cause permanent thermal distortion and diminish by 70-80% all physical properties of the formliner.

Once attached to the formwork, formliners should be stored on edge to prevent liner damage.

TRIMMING ELASTOMERIC FORMLINERS

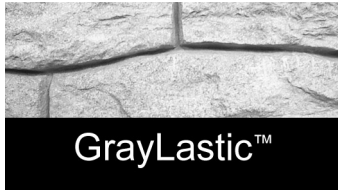
Should trimming of an elastomeric liner be required, the slower the cutting tool used, the easier the liner will be to trim. A crosscut handsaw provides the best trim on elastomeric liners. If a blade type circular handsaw is used, as many as five or six shallow, slow cuts should be made across the path of the trim. Extreme care should be taken to keep the saw blade from binding or from melting the material. Lubricating the blade with WD-40 during the trim may assist the cut.

If the liner is to be butted against a rustication strip or reveal, the blade angle should be set so that the liner is cut at the same angle as the reveal. These operations should be performed with the liner securely clamped to a steady workbench to prevent any "chatter". Positioning the line of the cut with approximately a 3-degree bow in the liner will also assist the trim.

Proper ventilation practices must be followed when cutting formliner material.



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ATTACHMENT TO FORMWORK

GrayLastic formliners are mold-bonded to 0.75" plywood. Mold-bonding the plywood does not eliminate the need for a form system facing. The use of a ganged forming system is recommended. GrayLastic formliners can be attached directly to the forming system by screwing or bolting to the face of the liner or through the back of the form using 1/4" diameter fasteners. Fasteners should be placed at 12" centers on all perimeter edges of the formliners and 18"-24" on center throughout the field. When the liners are expected to be removed and re-attached to the forming system several times over the life of the liner, attachment from the back of the form may be the best method. This will make locating the attachment screws easier and avoid repeated marring of the surface of the liner.

RECOMMENDED METHOD TO ATTACH GRAYLASTIC FORMLINERS

1. **Level and square the formwork so that proper alignment of the liner can be made. Dimensions should be marked so that edges, patterns and joints are square.**
2. **Working with one sheet at a time, position the formliner against the formwork so that edges, patterns and joints are square.**
3. **Screw the liner to the formwork with screws spaced approximately 12" on center around the perimeter and 18" to 24" on center throughout the field. Tek drywall screws work well because they are self-drilling and easy to install.**

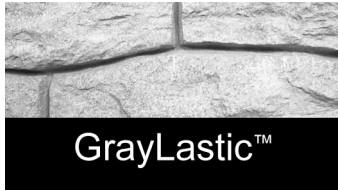
FORM RELEASE AGENT

The application of a good quality, reactive-type form release agent prior to the first use and after each subsequent re-use is critical to the performance of the formliner. Clean the formliner after each pour to remove any loose debris. The form release agent must be worked into the surface of the liner to ensure adequate coverage. Release agents should be sprayed on the liner as close to the time of concrete placement as possible. Minimize exposure to contaminants, dust, etc.

A water-based release agent works well for either single-use or multi-use plastic or extended-use elastomeric urethane formliners. **Do not use solvents or petroleum-based form release agents. They attack both plastic and elastomeric urethane liners.** It is recommended that the form release agent be tested against a small area on the form side of the liner for compatibility. Should the test area become tacky, the release agent is not compatible with the liner material and cannot be used. Consult with your form release manufacturer for specific information, such as coverage rates, drying time and compatibility.



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FITZGERALD FORMLINERS TAKES NO RESPONSIBILITY FOR ANY DAMAGE TO OUR LINERS DUE TO THE IMPROPER USE OR APPLICATION OF A FORM RELEASE AGENT. IF UNSURE OF THE RELEASE AGENT'S COMPATIBILITY WITH ANY OF OUR LINERS, CONSULT WITH THE CHEMICAL MANUFACTURER PRIOR TO USE.

PLACING CONCRETE

Most urethane formliners cannot withstand a rate of pour in excess of 600-750 psf. 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.

A test panel using the selected material should be poured simulating actual jobsite conditions and procedures, including: pour rate, height of wall, tie holes, reveals, joints in formliner panels, etc. Actual construction should proceed using the same method and materials throughout the project.

Architectural concrete should be placed using a pump and an elephant trunk to avoid mix separation, splatter and trapped air. Placement should be in two-foot lifts with no horizontal movement to avoid flow lines in the finished surface.

To avoid cold joints, architectural concrete placement should never be stopped part way up the pattern. The cold joint will be very apparent in the finished surface of the pattern.

STRIPPING FORMWORK

If possible, forms should be stripped within twenty-four hours of concrete placement. This is important because:

- 1. The heat of concrete hydration can degrade formliner material over an extended period of time and can cause sticking.**
- 2. Concrete may darken the longer the liner is in contact with the formliner surface.**
- 3. When using multi-use liners, the liner life can be shortened if forms are not stripped as soon as is practical.**

Formliners should always be stripped with an equal time interval between lifts. This will result in consistent concrete color in jobs requiring multiple pours.

Formwork should always be stripped at 90-degree angles to the form if possible. Ribbed or fractured textures will require special care to avoid breaking off fins from the concrete or the liner. A low profile pattern will be easier to strip than a high profile pattern.



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Allow extra time for stripping formwork when formliners are part of the job requirement. The added care in properly stripping formliners is much less expensive than repair of the surface or replacement of the liner.

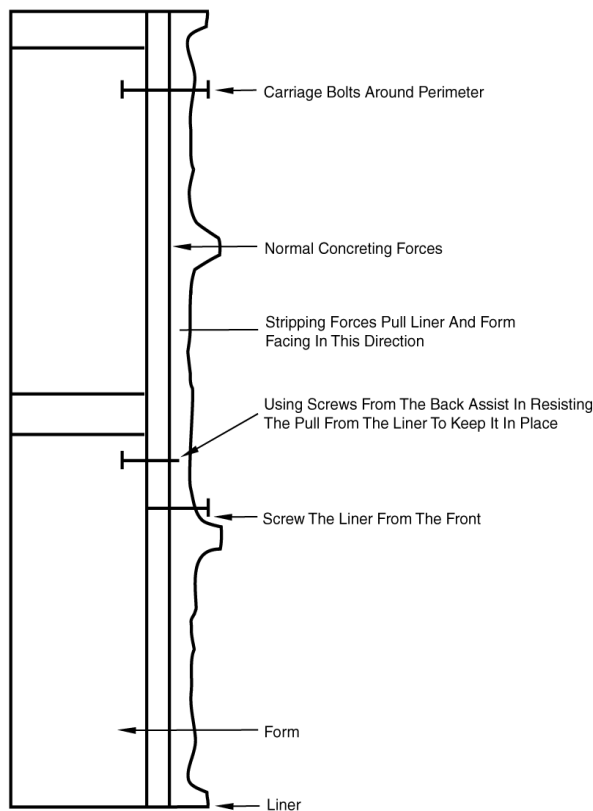
MANUFACTURING TOLERANCES

Mold Bonded to 0.75" plywood: +/- 1/8 inch (length and width)

Un-bonded (custom order only): to be determined by pattern

ATTACHING AND STRIPPING PROCEDURE

Fitzgerald Formliners has many GrayLastic patterns with a rough surface texture and grout lines that are embedded into the concrete 1 1/2" – 3". Care must be taken when stripping these formliner patterns from the wall due to the deep and narrow grout joints. Gang forms are required.



To assist in removal from the wall, adequate formliner attachment is critical. (Please refer to the illustration to the left.) Attaching the liner should occur from both the front and back sides of the form. Through the front-side, embed 1/4" carriage thru-bolts on 12" centers along all outside edges of the liner. At 18"-24" centers through the field of the liner, embed 1/4" coarse screws directly into the formliner plywood.

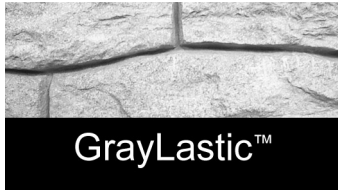
The deep grout lines and rough texture of the liner can create a potential for additional adherence to the wall as compared to that of shallower formliner patterns. Lengthy form stripping cycles make liner removal more difficult, as well. **For best results, stripping should be completed within 24 hours.**

Avoid rotating the forms away from the top of the wall when stripping begins. This could allow the formliner to become wedged into the concrete at the bottom of the wall, damaging the grout joints or raised portions on the formliner.

Strip forms evenly combining use of the crane and come-a-longs attached to the midpoints



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and bottom sections of the forms. Pull forms directly away from the wall. This procedure may take additional time to accomplish, but results in less liner damage.

Clean and apply form release agent on all liners prior to the first pour and after each subsequent pour. The form release agent must be mopped on so all surfaces are thoroughly coated. Clean formliners with a stiff brush after each pour to remove any concrete laitance and re-apply the form release agent.

Architectural concrete jobs are inherently more difficult than structural concrete jobs. As such, attention to detail becomes critical for satisfactory results. It is recommended that proper planning and execution be followed.

*Gang Forms Required

METHODS TO FIELD REPAIR

1. Zap-A-Gap (Super Glue)

Gluing damaged areas can repair some types of damage to the formliner, such as small chunks or divots that have occurred. First, clean the pieces with acetone and glue them back into position. Use this product on small area repairs.

2. Expanding Foam

Use this product to repair damaged areas of the formliner not easily repaired by the previous method. Expanding foam is difficult to work with and can be labor intensive.

3. Replacing Formliner

At times formliner damage is not repairable in the field. Most field repairs are temporary measures. Repeating repair work is normal after each pour if damage to liner is great and repair is extensive. Replacement of material is sometimes necessary.

Improper formliner preparation, such as poor cleaning between pours, type of release agent chosen, application of release agent, jobsite handling, storage and exposure to sunlight can all contribute to lessen the life expectancy of architectural formliners.



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