## INTRODUCTION

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

Vac-U-Form formliners are available in either single-use polystyrene or multi-use ABS plastic. Both are rigid plastic liners that are ideal for tilt-up or cast-in-place concrete. Vac-U-Form formliners are made in a wide range of gauge or thickness.

## CARE AND HANDLING

Plastic formliners should be covered with a tarpaulin when not in use. Most plastics 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 140° F will 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 PLASTIC FORMLINERS

Vac-U-Form formliners are available in 4' x 8' and 4' x 10' sheets. Because the surface to be textured with the formliner is usually not exactly 4' x 8' or 4' x 10", trimming may be required.

Prior to trimming, the effects of temperature should be considered. Thermal expansion and contraction of Vac-U-Form plastic formliners occurs as ambient temperature changes during the day. The amount of expansion can be estimated. As a rule of thumb, the liner will expand or contract approximately 1/32 inch in 10 feet with each 30° change in temperature during the placement of concrete.

Vac-U-Form liners trim easily with a circular handsaw and a fine-tooth plywood blade, such as the type used for cutting veneer paneling. 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" that could fracture the formliner surface. Formliners with minimal relief can be trimmed by scoring with a sharp knife and breaking off the excess.

***Proper ventilation practices must be followed when cutting formliner material.***

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## ATTACHMENT TO FORMWORK

Vac-U-Form formliners are tagged to identify the concrete side of the liner. Before attaching the formliner, be sure to identify this side. The concrete side can also be identified by a roughened, "hair-cell" texture or as the side with the highest resolution in the pattern.

## CAST-IN-PLACE

Level and square the formwork to ensure proper alignment of the liner. Dimensions should be marked to square edges, patterns and joints. Working with one sheet at a time, position the formliner against the formwork so that edges and joints are square.

Screw the liner to the wood or steel formwork or casting bed with screws spaced approximately 6" to 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. Seal seams with ABS or plumber's glue and joints as required. Do not use silicone. Some deeper patterns may require wood back-up strips to prevent formliner deflection.

## TILT-UP WALL

In tilt-up wall applications, a common method of formliner attachment is to place the liner on the slab, drill a hole through the formliner and into the concrete, place a wooden dowel into the drilled hole, break the dowel off flush with the surface, and then use a large-headed roofing nail to hold the liner in place.

It is important that the formliner is contained on all four sides so that concrete cannot move under it. The field area of the formliner must be held flat against the casting surface, ensuring that no deformations (blisters) are present in the formliner. Do not allow the formliner to move around freely. Load concrete onto the formliner from the centers, moving the concrete towards the outside perimeter with rakes. Do not allow concrete to be pushed under the formliner at panel-to-panel joint locations.

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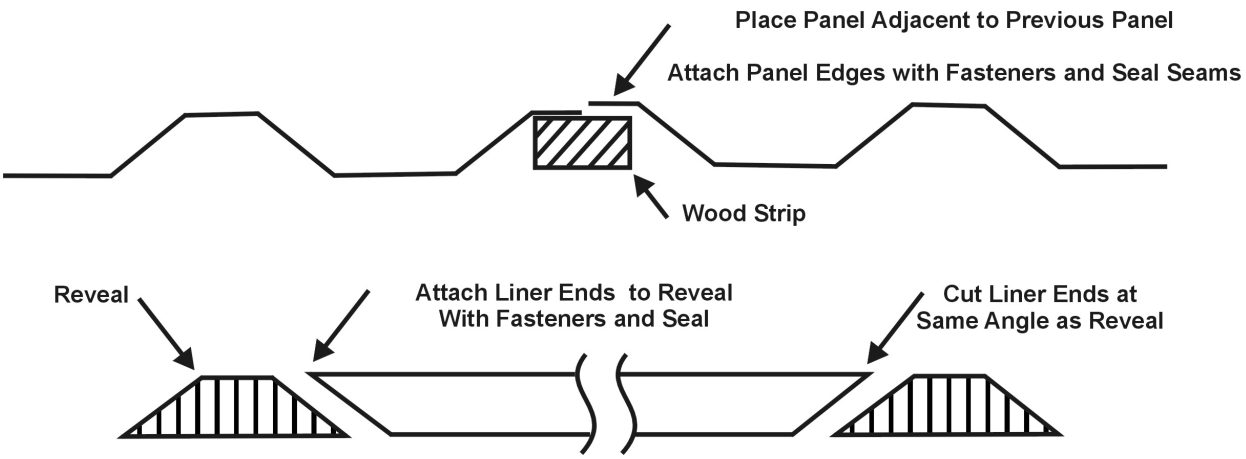


## FORM RELEASE AGENT

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.

A water-based release agent works well for either single-use or multi-use plastic or extended-use elastomeric urethane formliners. ***Most solvents and petroleum-based form release agents 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.

**FITZGERALD FORMLINERS TAKES NO RESPONSIBILTY 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 plastic formliners cannot withstand a rate of pour in excess 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.

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***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 24 hours of concrete placement. This is important because:

1. **The heat of concrete hydration can degrade formliner material over an extended period of time.** (ABS)

2. **When using multi-use liners, the liner can be shortened if forms are not stripped as soon as is practical.** (ABS)

3. **Concrete may darken the longer the liner is in contact with the formliner surface.**

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

Allow extra time 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 concrete surface or replacement of the liner.

## MANUFACTURING TOLERANCES

Width / length: ± 1/8 inch at time of manufacture. Normal shrinkage and expansion is approximately 1/32" in 10 feet with each 30°F change in temperature.

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