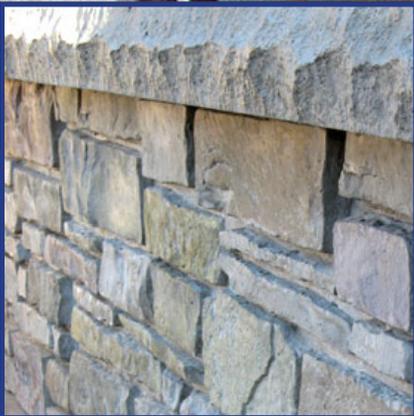


# American Formliners

## Application Guide





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### More Patterns... More Possibilities!

American Formliners can make a lasting impression in concrete at an affordable price. We have the project experience, pattern recommendations and material options to make sure every cast-in-place, precast or tilt-up application is successful.

American Formliners has the patterns, including brick, rope, fractured fin, wood grain and most DOT textures, that will complement almost any concrete structure. These patterns are being specified by architectural/ engineering firms and state Departments of Transportation, and installed by concrete contractors throughout North America, every day.

American Formliners provides several advantages:

- State-of-the-art manufacturing by an industry-trusted name
- Single-use, multi-use and extended-use material options
- Hard-to-find pattern lengths for greater forming versatility
- End-to-end and side-to-side matching for seamless appearance
- Cost-effective material pricing with nationwide availability
- Custom design capability for unique forming applications

## Application Summary

### Design

- **Texture** – Surface details and finishes are permanently molded into the formliner material during production resulting in a consistent concrete appearance.
- **Depth** – Geometric and high-relief textures can be reproduced using HIPS, ABS, PE or PPE materials. Undercut textures can be reproduced using the flexible PE or PPE material.
- **Specification** – Formliners are typically identified by pattern number and description, except for custom designs having drawings and supporting documentation.

### Budget

- **Project Budget** – The project schedule and forming cycle time typically dictates the material and budget requirements.
- **Labor Budget** – Reusable formliners, properly coordinated with concrete forming operations, can significantly improve site productivity, minimizing associated forming costs

**Reusability** – Single-use HIPS plastic, medium-use ABS plastic, and extended-use PE and PPE elastomeric materials are available for your specific concrete forming application.

**Rate-of-Pour** – Formliners are typically designed to withstand concrete placement of five feet per hour, but there are other materials/methods available if an application exceeds this limit.

### Attachment

Formliners are used in cast-in-place, precast or tilt-up. All mounting surfaces should be clean and dry. ABS and HIPS materials can be installed using screws or staples. PE and PPE materials are typically plywood-mounted with adhesive and subsequently bolted to formwork. Adhesive tapes, foam tapes and silicone caulks are used at joints and seams to minimize grout leakage.

### Alignment

The formwork must be properly aligned and in common planes. A “stack up” of tolerances can result in a noticeable “step” in the finished concrete surface, especially with “shallow” formliner patterns. Reveals or rustications are recommended at joints to simplify forming, accentuate the texture and reduce grout leakage.

### Form Release

Formliners should be sprayed with a premium form release before each use and within the same day concrete is placed. Form release should be applied with a low-flow, wide-angle, flat-spray nozzle and wipe with a cloth to insure an evenly-coated formliner surface. Formliners should always be covered when not in use.



## Technical Data

### Thermofrom

HIPS - High Impact Polystyrene

ABS - Acrylonitrile Butadiene Styrene

### Elastomeric

PE - Polyurethane Elastomer

PPE - Premium Polyurethane Elastomer

### Standard Formliners

HIPS Formliners can be used to provide a textured concrete surface, in a limited application, at an affordable price. Single use only.

ABS Formliners exhibit impact resistance and UV shielding to reduce the damaging effects of sunlight. Multiple uses up to 10 times.

### Premium Multi-Use Formliners

PE Formliners combine great resilience and high-tensile strength into a long-wearing surface. Multiple uses up to 40-50 times.

PPE Formliners provide exceptional reproduction of the most difficult and complex designs for a consistent appearance. Multiple uses up to 100+ times.

#### HIPS - High Impact Polystyrene (Single use only)

Properties	Rating	ASTM
IZOD Impact, ft.-lb/in.		
@70°F	2.0	D256
@0°F	1.3	D256
Tensile Strength	3,700 psi	D638
Heat Deflection	188	D695
Vicat Softening	212	D1525
Wt.lb./sq.ft.		
.070 mil	.449	
.090 mil	.577	
.110 mil	.705	
.130 mil	.833	
.150 mil	.966	

#### PE - Polyurethane Elastomer (Multiple uses up to 40-50 times)

Properties	Rating	ASTM
Shore A Hardness	45-50	D2240
Tear Strength, PLI	55	D624
Tensile Strength, psi	500	D638 (D412)
Ultimate Elongation	240%	D638 (D412)

#### PPE - Premium Polyurethane Elastomer (Multiple uses up to 100+ times)

Properties	Rating	ASTM
Shore A Hardness	60-65	D2240
Tear Strength, PLI	120	D624
Tensile Strength, psi	1150	D638 (D412)
Ultimate Elongation	1200%	D638 (D412)

#### ABS - Acrylonitrile-Butadiene Styrene (Multiple uses up to 10 times)

Properties	Rating	ASTM
IZOD Impact, ft.-lb/in.		
@73°	5.6	D256
@0°	1.9	D256
Tensile Strength	5,300 psi	D638
Heat Deflection		
@264 psi	199	D648
@66 psi	211	D648
Falling Dart Impact, ft.-lb.		
@73°F	23	
@40°F	14	
Specific Gravity	1.05	D792
Wt. lb./sq.ft.		
.070 mil	.451	
.090 mil	.580	
.110 mil	.705	
.130 mil	.833	
.150 mil	.961	

#### Manufacturing Tolerances @ 70F (All patterns, all materials)

Standard size: 4'x10'  
 Length: +1" to 2", -0" (shipped long for field trimming)  
 Width: ± 1/4"  
 Thickness: ± 1/16" at edge (except formliners over 1" thick)  
 Custom size: At customer request, additional charge.

## Forming Considerations

All formwork should be sufficiently rigid to remain sealed during concrete placement and vibration. Seal all joints and tie holes by caulking or gasketing to prevent grout leakage. Do not “lap” formwork over previous pours which have uneven architectural surfaces. Lapping will result in form offset with leakage that distorts the finished concrete appearance. (Further recommendations are contained in ACI 347R-14.)

### Tie Placement

Plan formwork so that tie placement is at rustications, reveals or other inconspicuous locations, to minimize the visual effect in the finished surface. 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.

To minimize grout leakage through tie holes when using HIPS or ABS plastic formliner, foam tape and/or foam rod should be used. This packing material is used to fill the space around the tie. Packing should be done from the face of the form and extend 1/8” through the HIPS or ABS plastic formliner.

The rubber-like texture of PE or PPE formliners simplifies sealing the tie holes. A slightly smaller tie hole diameter (1/16” or less) in the formliner will create a gasket effect and minimize grout leakage. Of course, the tie hole in plywood or steel backing must be large enough to accept the tie being used.

### Joints

It is very difficult to match pattern features at joints and make the surface appear 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. Carefully consider pattern dimensions to achieve an overall balanced design.

When joints are unavoidable, make the joint along the main features of the pattern. Joints should be made at the “top” of the pattern so the joint is in the “valley” of the concrete and less visible. Match pattern edges and features carefully, and minimize grout leakage at the joint with foam tape. This practice will help reduce the visible effect on the finished surface.

### Rustication

Rustication or reveal strips are often used at formliner joints. This accentuates the pattern and eliminates the need to produce perfect panel joints. It is recommended that rustication be applied as a closure on the top edge of the pattern and sealed with foam tape.

There are many different sizes and types of rustication that are compatible with formliners. The rustication must be strong enough to resist concrete pressures and flexible enough to conform to curves.

### Boxouts

There are two methods for forming boxouts; one requires permanently modifying the formliner, the other applies a closure to the face of the form liner.

Boxouts by modification require the formliners to be cut to accommodate the boxouts. The location of the pattern features should be determined before fabricating the required boxouts.

Boxouts by closure do not require the formliners to be cut. The required boxouts are placed over the formliner and materials are used to fill the voids between the boxouts and the formliner pattern. The materials are dependent on the configuration of the formliners and the concrete pressures.

### **Corners**

Corners by modification require that formliners be cut to accommodate the corners. The location of the pattern features should be determined before fabricating the required corners.

Corners by closure do not require that 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 prevent rust stains on the finished concrete surface. The clear distance between the outermost reinforcing bar and the surface should be at least 2" for plastic formliners and 1-1/2" for urethane formliners. 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 the 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 309R-05.)

### **Form Placement:**

It is 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, even when properly aligned. This creates a noticeable "step" in the finished surface, particularly with shallow formliner patterns.

**Caution:** Do not lap formwork over previous pours, which have uneven architectural surfaces. Such lapping will result in an uneven surface and grout leakage, marring the finished appearance.

### **Form Release:**

Formliners should always be sprayed with a premium grade form release, like American Formliners Release, the same day concrete is placed. Apply form release with a low, flat spray nozzle and wipe lightly with a cloth to insure a complete and even coat on the entire formliner surface. Vary the spray angle and direction to cover the entire surface area, including corrugated and textured surface features.

**Caution:** Low grade form release often contains reprocessed oils that degrade or damage the formliner material and cause formwork stripping problems.

**Caution:** Do not over apply form release to the formliner surface. Do not spray form release on reinforcing steel embedments, etc.

### **Handling:**

Formliners are shipped in a closed crate for protection. The formliners should remain in the crate for protection until needed on the work site. This will protect them from sunlight, weather, dirt and damage. Once attached to formwork, the formliners should be stored on edge. Protect formliners from heavy sharp and/or heated objects that could cause permanent damage.

### **Care and Storage:**

Formliners are sensitive to the effects of the sunlight, ultraviolet rays and extreme weather conditions.

Formliners should never be stored outside in direct or indirect sunlight. When not in use, formliners should be stored either indoors or under a protective tarp. Ultraviolet rays may cause the formliner to become brittle or may cause discoloration, which could be transferred to concrete surfaces. Formliners should never be exposed to temperatures in excess of 140°F (60°C) to prevent permanent deformation.

Thermal expansion and contraction is an important consideration. The HIPS and ABS formliners will expand or contract approximately 1/16" in 10' with each 10° temperature change. Formliner should be installed and fastened at about the same ambient temperature as expected during placement of concrete, early morning is recommended.

**Caution:** Temperatures in excess of 140°F (60°C) will cause permanent damage to the elasticity of both HIPS and ABS formliners. Most plastics degrade when exposed to intense sunlight for extended periods of time. Formliners should be stored indoors or under a tarp when not in use.

**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, rustications, intersections and joints. The test pour should be the height of the maximum wall to be produced. On approval, the actual construction should proceed using the same methods and materials to assure uniformity throughout the entire project.

**Concrete Mix:**

Architectural concrete requires a mix that provides workability while meeting design strength requirements. A workable mix combined with proper vibration will reduce the risk of air bubbles, honeycombing and surface blemishes. (Further recommendations are contained in ACI 211, 301, 303 and 309.)

**Concrete Placement:**

Architectural concrete should be placed using a pump and an elephant truck to avoid mix separation, splatter and trapped air. If not controlled, rock pockets, "honeycomb" and spatter marks may affect the appearance of the finished surface.

Place concrete in continuous 2-foot lifts and do not "move" or vibrate horizontally. Horizontal movement can create flow lines, spatter marks and sand streaking in the finished surface. Do not stop concrete placement part way. Generally, the more texture or relief on the pattern, the slower the concrete must be placed.

**Vibration:**

Internal vibration is the most common method for consolidating architectural concrete. Proper vibration will reduce voids, lift lines and surface blemishes. Avoid joint contact, damage to formliner, or dislodgment of formliner. (Follow ACI recommendations for the vibration of concrete.)

Vibrate each lift at 12" to 18" intervals, extending the vibrator 8" to 12" into the preceding lift then withdrawing slowly. The vibrated area should always overlap the previous insertion by a small amount. Consistent placement and vibration throughout the project will minimize variation in concrete color.

**Caution:** Architectural concrete requires thorough vibration. Formwork must be designed and sealed to resist the stress caused by vibration.

**Stripping:**

Formliners should always be stripped with an equal time interval from concrete placement to stripping.

Different time intervals will result in inconsistent coloring from different moisture loss. If possible, forms should be stripped within twenty-four (24) hours of concrete placement.

Strip formwork with formliners at right angles to the form, if possible. A low profile pattern will be easier to strip than a high profile pattern with more surface area. Ribbed and fractured patterns require special care to avoid breaking off fins and damaging the formliner.

**Caution:** Excessive stripping force and formwork pivoting can cause damage to the finished concrete features and textures.

### HIPS/ABS Installation

Available either in single-use, High Impact Polystyrene (HIPS) or multi-use, Acrylonitrile Butadiene Styrene (ABS), both are rigid plastic formliners, which are ideal for cast-in-place, precast or tilt-up applications.

Formliner patterns in HIPS plastic can be used to provide a textured concrete surface, in a single-use application, at an affordable price. Formliner patterns in ABS plastic exhibit excellent impact resistance and contain an ultraviolet shielding compound, which reduces the damaging effects of sunlight.

#### Materials:

The basic materials needed to attach and modify HIPS and ABS plastic formliners include:

- Staples (9/16" or 3/4" depending on pattern thickness) for attachment to plywood.
- Nails for attachment to plywood (enhances the finished look of wood patterns)
- Plastic pipe cement or external grade panel glue can be used when mechanical attachment is not possible.
- Foam tape and/or grout seal blocks may be required for pattern support, voids and modifications.
- Silicone caulking for pattern voids, modifications and small openings.
- American Formliner Release is recommended for all formliner applications.

The amount of material needed will vary with the size of the project and the method of attachment.

#### Tools:

The basic tools needed to attach and modify HIPS and ABS plastic formliners include:

- Tape measure
- Chalk line
- Circular saw with carbide tipped blade
- Power sander or grinder, 30 grit or less
- Power stapler
- Electric drill
- Hammer
- Sprayer with wand extension
- Personal protection equipment (PPE)
- Miscellaneous hand tools depending on attachment method

#### Cutting/Drilling:

Most formliners are shipped in 4'x10' sheets, though it is often necessary to trim the material because the plastic will expand and lengthen. The easiest way to cut plastic is to use a circular saw with a fine-tooth plywood blade (a blade with approximately 200 teeth is recommended). If the liner is to be butted against a rustication/reveal strip, then the blade angle should be set so that the liner is cut at the same angle as the rustication/reveal.

Cutting and drilling should be performed when formliners are securely clamped to a work bench with a cutting guide or drilling template.

**Caution:** Cutting can create dust and rough edges. The rough edges can be dressed with a sander and/or hand planer. Remember to remove all dust and debris from the surface. Sanding can create dust that might be inhaled. Long term exposure to this dust may be harmful. Always wear appropriate safety equipment.

**Attachment:**

Formliners can be used in cast-in-place, precast and tilt-up applications. Single-use HIPS is most frequently used for tilt-up applications and can be installed in many ways. Multi-use ABS is more commonly used for cast-in-place and precast applications and can be attached with mechanical fasteners or adhesives. Before attaching the formliner, first identify the side to be poured against. The side facing the formwork has a smooth, shiny surface; the concrete side has a roughened “hair cell” appearance.

**Installation - Modular Systems:**

1. Handset Systems - Assemble and brace the formliner side of the formwork first. Attach the plastic formliners before setting ties or the opposing formwork side. Gangform Systems - Level and square the formwork so formliner attachment can be made accurately in a horizontal plane. Dimensions should be marked so the edges, patterns and joints are square. If strongbacks are required, they should be attached to the formwork holding the plastic formliner.
2. Apply foam tape to the plate or sill that supports formwork to prevent grout leakage at the base of the plastic formliner.
3. Apply foam tape to back side of plastic formliner along all edges. Allow foam tape to extend beyond the edge when the form liner will be jointed.
4. Position plastic formliner against the formwork so that edges, patterns and joints are square. Work with one sheet at a time.
5. Staple the plastic formliner on 3” centers and around tie hole locations. Staple heads should be driven flush with the surface and “hidden” in pattern features/corners. Screws or nails should be spaced approximately 3” to 6” on center around the perimeter and 12” to 18” in the center. Self-drilling Tek drywall screws work well and are easy to install.
6. Foam tape should be positioned behind the joint of two pieces and pressed down firmly. If a ribbed pattern is used, insert a grout seal block to support the joint and prevent concrete seepage.
7. Grout seal blocks may also be needed to seal around tie holes, fill voids in boxouts and open-end patterns or support especially deep patterns.

**Installation - Plywood Backing:**

1. If a secondary underlayment with formliner is preferred, then 1/2” or 3/4” uncoated plywood should be used. If the formwork face is not sacrificial, then attachment with t-nuts (1/4” minimum) placed 12” on-center for 1/2” plywood, and 24” on-center for 3/4” plywood is recommended. A washer is required on the back side of the form.
2. Apply foam tape to the back side of the plastic formliner along all the edges.
3. Position plastic formliner against the plywood so the edges are square and press down firmly. Work with one sheet at a time.
4. Staple the plastic formliner on 3” centers and around all the tie locations. Staples must be driven flush to the surface.
5. Attach the formliner/plywood “assembly” to the form face. Screws should be driven from the back of the form face into the plywood. Screws should be positioned 12” on-center and capture 3/4 of the thickness.
6. Each subsequent formliner/plywood assembly should be carefully aligned and foam tape used at all joints.
7. Grout seal blocks may also be needed to seal around tie holes, fill voids in boxouts and open-end patterns or support especially deep patterns.

## Installation - Metal-faced Forms

When adhering plastic formliners to metal-faced forms, use “Formica Top” adhesive or an adhesive designed for bonding ABS plastic to metal. Glues and adhesives are not generally recommended because they are difficult to apply on the job site, even though they bond well.

## Installation - Tilt-Up Bed

Wooden dowels inserted into the casting slab is the recommended method for positioning tilt-up formliner. Drill a 1/4” hole through the formliner and slab, then insert a 1/8” wooden dowel. Using a roofing nail, secure the formliner position by nailing to the dowel. The dowels are drilled out of the casting slab and the holes are patched after the panels are complete.

Duct tape can be applied to the back side of the formliner. This is the recommended method for precast and tilt-up beds. The formliner is assembled upside down and alongside the bed and “rolled” into the form. Some patterns may require additional backing depending on the depth and/or width of the design. Prior to concrete placement, foam tape, backer rod and/or wood strips can be used.

## PE/PPE Installation Guide

Available either in durable, Polyurethane Elastomer (PE) or extremely durable, Premium Polyurethane Elastomer (PPE), both elastomeric formliners are ideal for cast-in-place, precast or tilt-up applications.

Formliner patterns in PE polyurethane combine resilience and tensile strength for 50-75 reuses. Formliner patterns in PPE combine resilience and high tensile strength for 100 reuses. While the initial cost of these materials may seem high, the applied cost is low because of the reusability.

### Materials:

The basic materials needed to attach and modify PE and PPE formliners include:

- 2”x 4” Lumber
- Box (6D) nails and (#6) finishing nails
- Wood tack strips
- Disposable one gallon mixing containers
- Mixing sticks
- Contact adhesive
- Cotton rags
- Methylene chloride cleaning solvent
- Silicone caulking for voids and modifications
- Foam tape for voids and modifications
- Sanding disks, #36 or #24 grit
- Deck brush with natural bristles
- Paint brush with natural bristles
- American Formliner Release is recommended for all formliner applications.

The quantities of materials needed will vary with the size of the project and the method of attachment.

### Tools Required:

The basic tools needed to attach and modify PE and PPE formliners include:

- Electric drill with hole saw
- Hammer
- Saber saw with knife blade

- Power sander or grinder
- Power rotary rasp
- Chalk line
- Tape Measure
- Utility Knife
- Serrated Trowel (1/16")
- Measuring Cup
- Sprayer with wand extension
- Personal protection equipment (PPE)
- Miscellaneous hand tools depending on attachment method.

**Cutting/Drilling:**

Formliners PE and PPE can be modified by cutting and drilling. Use a utility knife or saber saw with a knife blade for cutting. A cylinder type hole saw can be used for drilling. Perform these operations on formliners that are securely clamped to a workbench with a cutting guide or drilling template. The work place should be steady to prevent excess friction that can melt the formliners and disable tools.

**Caution:** Sanding, cutting and drilling can create dust that might be inhaled. Long term exposure to this dust may be harmful. Workers should wear appropriate safety equipment.

**Installation - Gangform Systems:**

1. Abrade/scuff the formwork face and back side of the formliner. Remove all dust and debris.
2. Mark the formliner position on the formwork face. Work with one sheet at a time. Place the formliner on the mark and "fold" about half the pattern back onto itself.
3. Mix the adhesive and apply evenly to the formwork face and back side of the form liner. Adhesive must be applied to the edges and corners. Do not use adhesive on formwork with residual form release.
4. Once the adhesive is tacky, slowly roll the formliner back into the marked position being careful not to trap air underneath the surface. Temporarily secure the edges and corners with tack strips.
5. Repeat the steps for the other half of the formwork face and formliner, making certain the center, edges and corners have been treated, positioned and tacked in place.
6. Repeat the steps for each sheet of formliner, carefully compressing adjacent formliner joints without warping or distorting the pattern surface.
7. Evenly weight the entire formliner surface for complete adhesive bonding. Adhesive is fully cured in 48 hours at room temperature.
8. Sand or grind the edges or joints as needed to match pattern features between sheets.

**Installation - Plywood Backing:**

1. If a secondary underlayment with formliner is preferred, then 1/2" or 3/4" uncoated plywood should be used.
2. Abrade/scuff the plywood and back side of the formliner. Remove all dust and debris.
3. Allow the formliner to overhang the plywood edges by 1/32" for adjoining pieces.
4. Position the formliner on the plywood underlayment. Work with one sheet at a time. "Fold" about half the pattern back onto itself.
5. Mix the adhesive and apply evenly to the formwork face and back side of the form liner. Adhesive must be applied to the edges and corners. Do not use adhesive on formwork with residual form release.
6. Once the adhesive is tacky, slowly roll the formliner back into the marked position being careful not to trap air underneath the surface. Temporarily secure the edges and corners with tack strips.
7. Repeat the steps for the other half of the formwork face and formliner, making certain the center, edges and corners have been treated, positioned and tacked in place.
8. Repeat the steps for each sheet of formliner, carefully compressing adjacent formliner joints without warping or distorting the pattern surface.

9. Evenly weight the entire formliner surface for complete adhesive bonding. Adhesive is fully cured in 48 hours at room temperature.
10. The formliner/plywood assembly is now ready for mounting. Carefully mark the gangform so edges, patterns and joints are square and properly positioned for attachment.
11. Attach the formliner/plywood assembly to the gangform using screws driven from the back of the form face into the plywood. Screws, placed 12" on-center for 1/2" plywood, or 24" on-center for 3/4" plywood, and capturing 3/4 of the plywood thickness, is recommended.
12. Sand or grind the edges or joints as needed to match pattern features at joints and between sheets.

### **Repair:**

Cuts or tears in formliners can often be repaired with contact adhesive. Work the adhesive into the formwork face behind and on the edges of the cut or tear. Tack or weight the area while the adhesive is setting. After setting, lightly sand residual adhesive to avoid a gloss-producing spot on the concrete.

## **American Formliners Warranty**

American Formliners Inc. (hereafter known as Supplier) warrants that the Supplier of concrete accessory products sold to Purchaser will be free from defects in materials and workmanship for a period of six (6) months from the date of delivery, and the Supplier will repair, or in its sole discretion, replace, any Product or part thereof found to be defective at the time of delivery if such Product or part is returned (at Purchaser's expense and risk) and received by the Supplier within ten (10) days after the applicable warranty period. Descriptions, representations and other information concerning the Supplier contained in the Supplier's catalogs, advertisements or other promotional materials or statements or representations made by the Supplier's sales agents or representatives shall not be binding upon the Supplier and shall not be part of this limited warranty unless expressly identified in writing as PRODUCT SPECIFICATIONS.

This limited warranty does not cover normal maintenance, or items consumed during installation or normal operations, normal wear and tear, use under circumstances exceeding specifications, use for purposes other than the use for which the Products were intended, abuse, unauthorized repair or alteration, improper installation, failure to follow the Supplier's printed instructions, guidelines and recommendations for installation and use, lack of proper maintenance or damage caused by natural causes such as fire, storm, or flood. Purchaser shall determine the suitability of the Product for his intended use and Purchaser assumes all liabilities and risks whatsoever in connection therewith.

This limited warranty is Purchaser's exclusive remedy. It shall not be deemed to have failed of its essential purpose so long as the Supplier is willing and able to repair or replace defective products or parts thereof in the manner specified. No allowance will be made or repairs made by Purchaser.

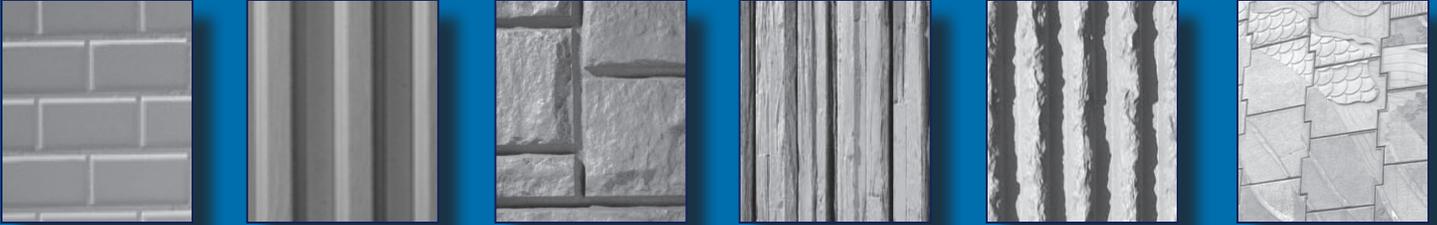
Except as herein provided, the Supplier shall not be liable to Purchaser in any manner with respect to the Products. In no event shall the Supplier liability to Purchaser ever exceed the purchase price of the allegedly defective Product. Except as herein provided, the Supplier shall not be liable for transportation, labor or other charges for adjustments, repairs, replacements of parts, installation, or other work, which may be done upon or in connection with the Products sold.

THE SUPPLIER SHALL NOT IN ANY EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER, INCLUDING LOST PROFITS, whether arising from any defect in the Products, any use of the Products, from Purchaser's inability to use the Products, or otherwise. This limited warranty applies to only products made by the Supplier.

NO OTHER EXPRESS AND NO IMPLIED WARRANTIES OF ANY TYPE, WHETHER FOR MERCHANTABILITY, FITNESS FOR A PARTICULAR USE, OR OTHERWISE, OTHER THAN THOSE EXPRESSLY SET FORTH ABOVE (WHICH ARE MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES) SHALL APPLY TO THE PRODUCTS.



# *Leave a lasting impression in concrete with American Formliners!*



## **AMERICAN FORMLINERS PROVIDES THESE ADVANTAGES:**

State-of-the-art manufacturing by an industry-trusted name

Single-use, multi-use and extended-use material options

Hard-to-find pattern lengths for greater forming versatility

End-to-end and side-to-side matching for seamless appearance

Cost-effective material pricing with nationwide availability

Custom design capability for unique forming applications

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