

**Saving the environment one backyard at a time.**

# **UNIVERSAL**

ENVIRONMENTAL CONTAINMENT SOLUTIONS

# **LINERS**



Septic Tank Liners



Breakout Barriers



D-Box Liners

Pump Chamber Liners



Sand Filter Liners

# Introducing the Universal Liner System

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The **Miller Environmental Universal Liner System™** is an effective and inexpensive solution to precasted concrete product leakage and deterioration. Our **Universal Liner™** is guaranteed to make your product both watertight and environmentally safe. Our polymer material has been developed and specially formulated to be flexible at and below freezing temperatures and chemically resistant against elements found in dozens of applications. It has been tested and proven to provide a long-lasting barrier to such liquids as raw sewage, and other wastes.

The Universal Liner is available in a variety of thicknesses and can be formulated to be resistant to virtually any chemical, liquid or gas that your product may contain. It can be utilized for any or all of the following products:

- Septic tanks
- Catch basins
- Holding tanks
- Utility vaults
- Drinking water tanks
- Industrial holding tanks
- Manholes
- Rural area fire department holding tanks (cisterns)
- Breakout barriers
- Primary & secondary fuel containment
- Lift stations
- Pump chambers
- Distribution boxes
- Sand filter liners
- Food processing holding tanks
- Any precast product !

Miller Environmental Products has a patented method for attaching the Universal Liner to the interior or exterior of your precasted concrete product as part of the manufacturing process. This method not only creates a watertight seal but also prevents deterioration of your product's concrete material.

The Universal Liner is fabricated by using radio frequency technology to form any size, shape or configuration required by your precasted concrete product. Our patent pending polymer material is available in various thicknesses and can be formulated to be chemically resistant to virtually any liquid contained by your product.

## For use on new or existing tanks

Our Universal Liner can be used for new and existing precasted concrete products. We manufacture a patented liner for the purpose of retrofitting products already in use. This liner can be easily installed by accessing the concrete product (i.e leaking septic tank) through the access cover without having to bear costly excavation expenses and tank replacement.

# Features of the Universal Liner System

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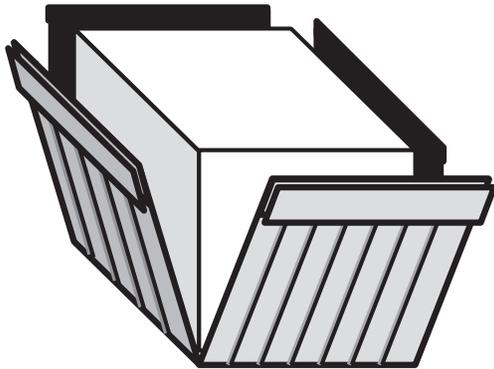
Our Universal Liner will help you to meet new testing codes and requirements. The addition of our technology will bring significant progress toward system reliability and effectiveness. Our product will also enable you to fulfill the constantly changing demands of both your customers and state and federal agencies. In all areas in which we have demonstrated our Universal Liner, we have received great acceptance and support from the Department of Environmental Protection (DEP), Board of Health agents, and water pollution agencies.

Collectively we should not only expect, but demand better performance and longevity from our septic systems. This will ensure longer lasting systems, as well as a safer environment provided by professionals in our field.

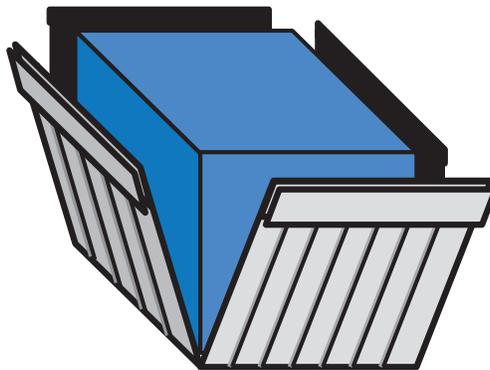
**Join the effort to clean up our environment!** The Miller Environmental Universal Liner System is the next generation in environmental protection for your precasted concrete products.

- Designed for use in virtually any tank size, shape, or configuration in single or multi pieces, and/or compartments.
- Made to fit the inner- or outer-core of your mold before pouring cement.
- Custom made to fit precasted concrete products of any size, shape, or configuration, new or existing.
- Requires no costly excavation (in retro-fit applications).
- Fastens to the interior of the tank and fits easily through the access cover.
- Connection systems, taping and/or adhesive methods are available to completely enclose or connect single or multi pieces, and/or compartments of your concrete product.
- Installs easily and quickly.
- Durable quality adds years to the life of all precasted concrete products, as well as to the life of the system.
- Models range from our Cast in Place to our Retro-Fit versions.
- Our polymer material can be formulated to be chemically resistant to virtually any liquid.
- Helps meet vacuum-testing, state, and federal agency codes for true watertightness.
- Protects groundwater from contamination.
- Protect the concrete from chemical and gas deterioration
- Creates a watertight seal around concrete in areas such as seams, lids and pipes.

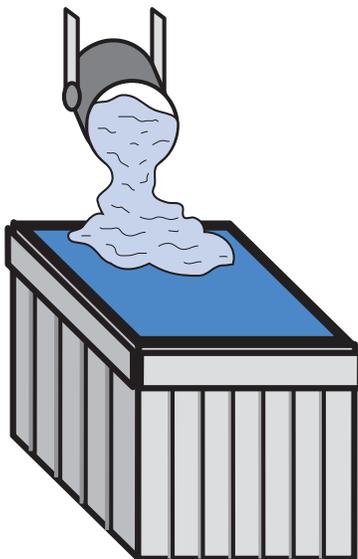
# Cast-In-Place Installation Method



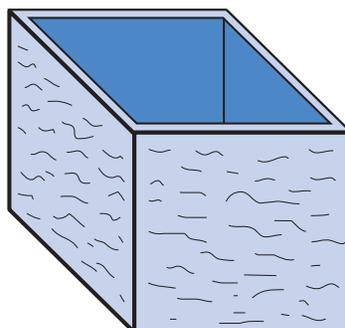
Empty mold with core



The **Universal Liner™** is placed over the core of the mold.



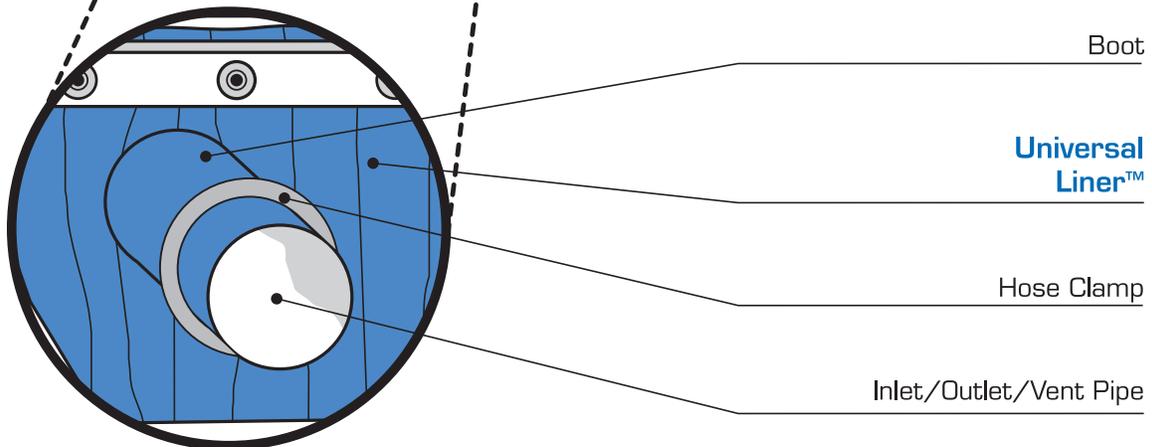
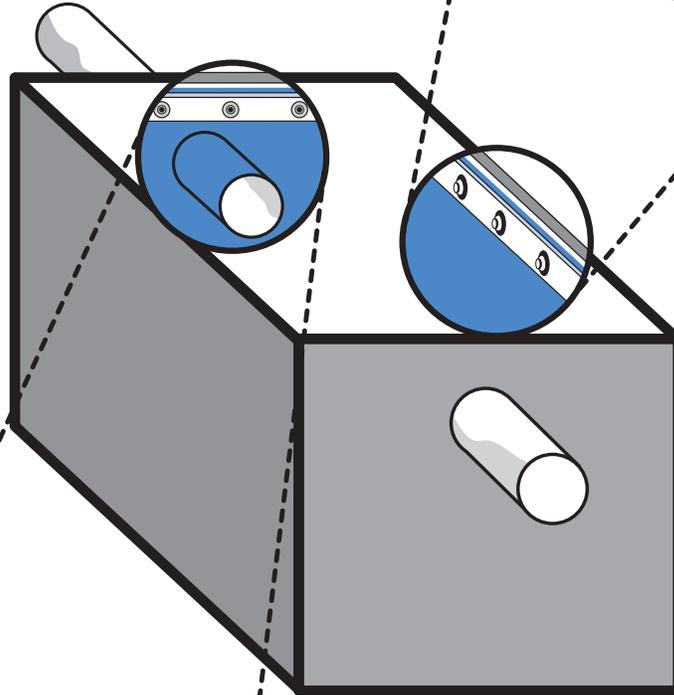
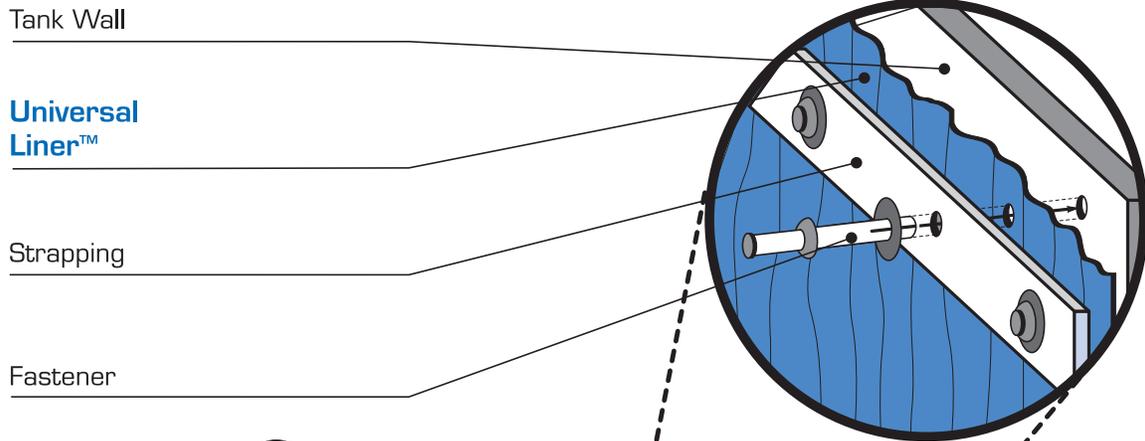
The mold is closed and cement is poured as normal directly on the **Universal Liner™**.



Finished vault is now completely lined on the inside with the **Universal Liner™**.

# Retro-Fit Installation Method

Fastens to the top, interior perimeter



Watertight inlet and outlet pipe

# Flexible Membrane Liners for Concrete Precast Products

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The Universal Liner, designed by Miller Environmental Products, Inc., is a single-ply construction fabricated primarily of polyvinyl chloride (PVC), a polymer compound proven to be chemically resistant to known elements of effluent. Our Universal Liner is shaped and joined with radio frequency-bonded seams and can be easily handled and field welded using simple, proven construction methods such as chemical fusion, adhesives and tapes as required. Our liner can be cut, molded, and R-F welded to accommodate any size, shape or configuration.

The Miller Environmental Universal Liner System is an effective and economical solution to repairing and preventing precast concrete leakage and deterioration. The Universal Liner is guaranteed to add years of life to your product and system making it both watertight and environmentally safe.

## I. General

Our PVC material has been tested and proven for over 40 years. Typical applications include, but are not limited to, septic tanks, landfills, sewage lagoons, industrial waste ponds, primary and secondary containment, reservoirs, canals, and farm ponds. Our product is also available for many types of precast products such as lining septic tanks to ensure longer life and watertightness.

## II. Product Description

It has been tested and proven to provide a long-lasting barrier to water, raw sewage, and liquid waste. Other materials are available for required resistance to meet the requirements of your particular project.

Miller Environmental Products, Inc. has a patented method for attaching the Universal Liner to the interior of your precast concrete product as part of the manufacturing process. Using this cast-in-place method, our liner is fabricated to fit the precaster's mold core and is secured to the mold interior with our patented attachments. After the liner is in place, the cement is poured into the mold according to normal procedure. Once the tank, vault or other cement product has been cured and removed from the mold, it is completely lined with our PVC liner. Our cast-in-place method not only creates a watertight seal but also prevents deterioration of the product's concrete material.

The Universal Liner can also be retrofitted into an existing tank or vault through the access cover. Our flexible PVC liner can fit through an 18" diameter manhole cover allowing an installer to attach the liner to the inside perimeter of the tank or vault (completely lining the interior). If high groundwater is an issue, the liner should also be attached to the exterior of the tank or vault to prevent outside water penetration. In

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new applications our interior and exterior retrofitting methods guarantee a watertight tank or vault. Liners are also available to line the lid and risers up to ground surface.

### **III. Typical Precast Concrete Installation**

The Universal Liner is fabricated to the specifications of virtually any tank size, shape, or configuration in single or multi pieces, and/or compartments. Once the liner has been placed inside the core, the manufacturer pours the cement into the mold according to normal procedure. The liner is made with exterior anchors that embed themselves in the poured cement to ensure a tight, smooth bond. This bond is further strengthened by the close adhesion of the concrete to the liner's slightly embossed surface. Extra material is folded to allow the liner to be continuously attached as the precast product is stacked or joined. The finished, lined, precast concrete product is watertight and impenetrable by liquid and air-bound chemicals and gases. In this application, there are two methods to insure quick watertight inlet and outlet connections: pre-attach boots or proper cut and slide, quickly and easily making them both water tight.

### **IV. Typical Retrofit Installation**

In order to perform a retrofit installation of the Universal Liner, the tank or vault's access covers must be fully exposed. The tank or vault is then pumped, power washed, and aerated, in accordance with OSHA confined space entry procedures. Once a visual inspection of the interior of the tank or vault has been performed, the equipment, hand tools, and liner, which is folded, shipped, and handled in a small container, are passed through the access cover. The liner is installed using a variety of fasteners and boots to accommodate inlet and outlet pipes (for watertight connections). All materials are resistant to the types of chemicals and/or corrosion typical to the particular application. Due to the flexibility of our fabrication procedures, the Universal Liner can be used in virtually any tank size, shape, or configuration in single or multi pieces, and/or compartments.

### **V. Exterior Applications**

In high groundwater and other highly sensitive areas, the Universal Liner can be used on the exterior of the tank or vault to prevent hydrostatic penetration or to provide extra leakage protection. The Universal Liner can also be used as a breakout barrier or sand filter liner (in areas where one is required) or simply to line and water proof underground breakout barrier walls. Some installations may require the lid and risers to also be lined to ground surface.

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## **VI. Product Adaptability**

In cases that require the use of two or more pieces of PVC liner, our material can be sealed together using a chemical fusion agent. The liner surfaces are cleaned of dirt and liquid then overlapped onto one another. The chemical fusion agent is brushed onto the overlapped areas with a brush or squeeze bottle and the liners are pressed firmly together. All seams are then visually inspected. This makes one, continuous liner for multi-connected precast products. Please refer to the material data sheet for information on the particular chemical fusion agent used in this process. We also now have available tape products and processes for joining pieces together.

## **VII. On-Site Product Repairs**

Liner damage is repaired on-site with additional pieces of PVC material and chemical fusion agents or adhesives. A liner tear is covered with a rounded-corner patch extending six inches beyond the damaged area on all sides.

## **VIII. Sand Filter Liners**

We specialize in many types of sand filter liners. We use different chemical resistant materials to meet your needs and budgets. Rigid, semi-rigid, and flexible materials are utilized for these applications.

Groundwater is the major source of our nation's drinking water. With Americans consuming approximately 110 million gallons of water a day, it has become increasingly important to protect our limited groundwater resources. Contrary to popular belief, preserving our groundwater does not have to be a difficult or costly venture.

# Flexible Membrane Liners for Concrete Precast Products Specs

## Typical Physical Property Values of our Chemical Resistant (PVC) Polyvinyl Chloride Flexible Membrane Liner Film

Gauge: 30 mil    Hand: 5S    Form#: -98004.0    Operating Temperature Range: 0F to 140F

Property	Unit	Test Method	Required	Value
Durometer	Shore A	ASTM D-1240		77
Specific Gravity	g/cc	ASTM D-792		1.27
Tensile Strength	PSI	ASTM D-882		MD 2150 TD 1840
Elongation	%	ASTM D-882		MD 280 TD 310
Elmendorf Tear	g/mil			MD over 300 TD over 300
Cold Impact	°F	ASTM D-1790		passed at -20
Hydrostatic Resistance (lbs/sq in)		ASTM D-751	100 min.	115
Resistance to Soil Burial		ASTM D-3083	Breaking Factor +/- 5% Elongation at Break +/- 20% Modulus at 100% +/- 20% Elongation	Pass  Pass Pass
Shrinkage		ASTM D-1204	Less than 5% MD	-1.5

**30 mil Sample**

**(Also Available 3 mil - 120 mil)**

# Impervious Breakout Barrier Material Rolls

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Miller Environmental Products, Inc. is also pleased to make available a rigid, impervious Breakout Barrier material in easy to use rolls. Our 40 mil polyethylene material comes in 5' x 100' and 10' x 100' rolls ready for delivery for septic system installers to use as breakout barriers. As well as being chemical resistant, our material is rigid and stands up easily for back filling which makes installation more efficient, as well as adding to it's ability to stay in position where intended.

Our 40 mil material (polyethylene) has been tested and used for over 40 years. Typical applications include septic system breakout barriers, landfills, sewage lagoons, industrial waste ponds, etc. Now making your decision is easy for what to use in your next installation or specify into your next septic system design. We warranty our material for 20 years.

Our 40 mil rolls are competitively priced (please call for current pricing) and weigh approximately 100lbs. (5ft roll) to 200 lbs. (10ft roll). Our liners can also be purchased in custom sizes to fit the exact requirements of your next job. This saves you money and leaves next to no wasted material. Pond liners and such are available in much larger sizes.

Our liner material can be sealed together using our 2 sided adhesive tape for easy installation in the field. Our tape gives you a strong bond that will hold up in most any condition. Our tape comes in 3"x 50' rolls

Don't be fooled by using other materials that are not recommended for this application. The manufactures will not warranty it being used as breakout barriers. And don't take our word for it, call the manufacturers directly yourself.

Remember our material has been tested and used for over 40 years and has a 20 Year warranty. [Model #MBE4OM \(Miller Breakout\)](#)

Call us now for more information about our products and services or visit our web site at [www.millerenvironmentalinc.com](http://www.millerenvironmentalinc.com).



**40 mil Sample**

# Impervious Breakout Barrier Material Rolls Specs

## Typical Physical Property Values of our Chemical Resistant 40mil Polyethylene Breakout Barrier Material

Properties	Test Method	Minimum Roll Averages	Typical Roll Averages
Thickness mils (mm)	ASTM D 1583	37 (0.94)	40 (1.02)
Density lb/ft <sup>3</sup> (g/cm <sup>3</sup> )	ASTM D792 or ASTM D1505		57.7 (.925)
Minimum Tensile lb/in. width (N/cm width)	ASTM D638 1. Tensile strength at yield 2. % elongation at yield 3. Tensile strength at break 4. % elongation at break 5. Modulus @ 100% elongation	80 (140) 13 170 (305) 650	84 (147) 13 175 (314) 700 68 (119)
Hydrostatic Resistance psi (kPa)	ASTM D751	230 (1586)	250 (1724)
Puncture Resistance lbf (N)	FTMS 101 C - Method 2065	61 (271)	65 (289)
Tear Resistance lbf (N)	ASTM D1004	24 (107)	26 (116)
Volatile Loss - Method A	ASTM 1203		< 1%
Resistance to Soil Burial (% change maximum in original value)	ASTM G22 1. Tensile strength at yield 2. Tensile strength at break 3. Elongation at yield 4. Elongation at break 5. Modulus of elasticity		- 4%
Low Temp, Impact Failure Temp F (C)	ASTM D746		< .70 (< .94)
Dimensional Stability % Change	ASTM D1204		< 2
Environmental Stress Crack Resistance Hours to Failure	ASTM D5397 Method A		> 400
Carbon Black %	ASTM D1803	2.5	2.75
WVTR gH <sub>2</sub> O/100 in <sup>2</sup> /24 hrs (gH <sub>2</sub> O/m <sup>2</sup> /24 hrs)	ASTM E96 Method A 73° F, 50% RH		.016 (.018)
Perms grains/ft <sup>2</sup> /hr/in.Hg (grams/m <sup>2</sup> /day/mm Hg)	ASTM E96 Method A 73° F, 50% RH		.021 (.026)

### Factory Seam Requirements

Bonded Seam Strength lbf/in. width (N/cm width)	ASTM D4437	72 (126)	80 (140)
Seam Peel Adhesion lbf/in. width (N/cm width)	ASTM D4437	56 (98)	62 (109)

Nominal Weight/Thousand Square Feet: Model #MBE40M (Miller Breakout Barrier) - 200 lbs

Note: To the best of our knowledge, these are typical property values and are intended as guides only, not as specification limits. MILLER ENVIRONMENTAL PRODUCTS, INC. MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.



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