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Layfield believes, to the best of its knowledge, that specifications and recommendations are accurate and reliable. However, since site conditions and installations are not within our control, Layfield does not guarantee results from use of the information provided and disclaims all liability from any loss or damage. No warranty expressed or implied is given.



Layfield's headquarters and manufacturing facility in Vancouver, Canada

The Layfield Group is the only integrated organization that provides tailored polymer-based solutions that are proven to protect our families, communities, and environment. Organized within a matrix management construct, we strategically invest in two complementary business units; Geosynthetics and Flexible Packaging, each with their specialized market segments. Layfield does business throughout North America with a growing international business focused in Australia, South America and Asia.

SECTION 1 MANUFACTURING CAPABILITIES

Layfield is a leading supplier of extruded, fabricated and installed polymer based products. Layfield was originally established in the mid-1950s as a fabricated plastics business. In 1978, the current owners purchased Layfield and diversified the product line. Layfield has pursued an aggressive course of expansion through acquisitions, in-house developments and diversification.

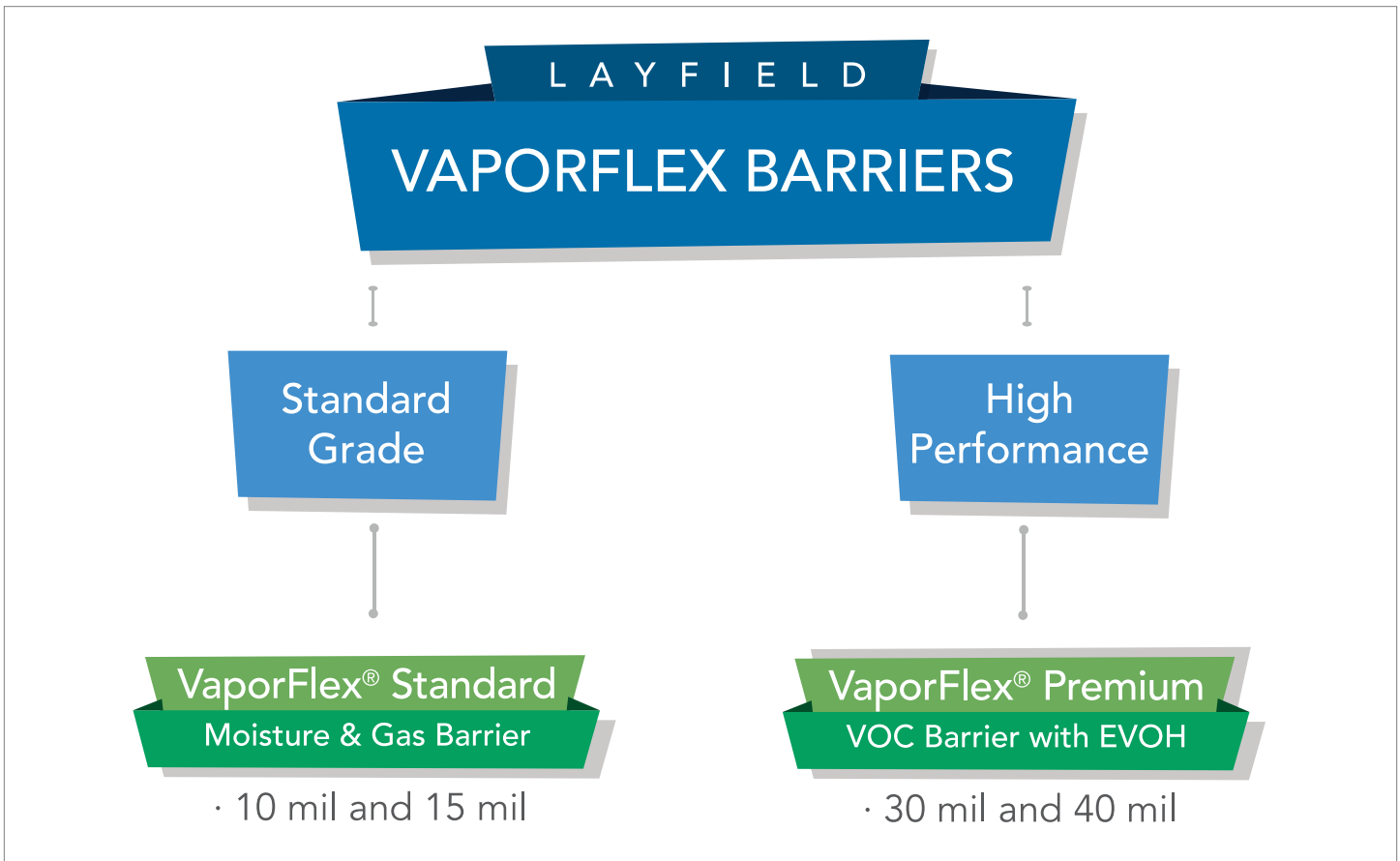
We provide industry owners with single source accountability through our integration capabilities which combine geomembrane manufacturing, fabrication, construction and maintenance services.

The manufacture of geomembranes at Layfield is governed and controlled by our registered quality management system which meets the requirements of the ISO 9001:2008 standard. Each product is certified to meet published Minimum Average Roll Value

(MARV) specifications. Layfield can provide signed mill certificates for each lot of geomembrane produced, showing actual results for specified properties.

Layfield manufactures and supplies a full range of standard grade and specialty fortified geomembranes. Fortified geomembranes are defined as a product heavily treated with special stabilizers providing enhanced heat, UV stability and chemical resistance. Our Technical Service Group is constantly developing innovative ways to enhance the quality of our existing products and develop new and more specialized products.

Layfield manufactures some of the industry's most popular brands of geomembranes including our Enviro Liner® and HAZGARD® geomembranes. Layfield is able to produce a variety of wide geomembrane widths and thicknesses designed both for prefabricated liners and field installed liners. Our co-extrusion process provides texturing capabilities and a variety of specialty skin colors.



SECTION 2 Product Overview

Layfield manufactures and supplies a full range of standard grade and specialty fortified polyolefin geomembranes. Figure 1 shows the placement of VaporFlex product line in the Layfield family of polyethylene geomembranes. Our VaporFlex® products are designed to provide containment for a broad range of applications. Our VaporFlex® Standard (STD) has been designed to perform as a Class A vapor barrier that exceeds all ASTM E1745 requirements. VaporFlex® prevents the infiltration of moisture through concrete slabs and foundations, thus preventing mold formation and growth. Mold formation has become a major liability for both property owners and the construction industry in North America. VaporFlex® Standard is available in 10 and 15 mil thickness. VaporFlex® Premium is a 7-layer co-

extruded geomembrane designed to provide barrier to methane, radon and other volatile organic compounds (VOCs) that exist naturally or is a result of an abandoned industrial/commercial facility suspected of polluting the soil due to hazardous waste. VaporFlex® Premium is available in 30 and 40 mil thickness.

Application overview of our Standard and Premium VaporFlex® is available in section 5 of this technical bulletin.

SECTION 2a VaporFlex® Standard Product Overview

VaporFlex® is manufactured from a special blend of virgin polyolefin resins and additives designed

to perform as a Class A vapor barrier. The Class A is ASTM's highest performance standard for "Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs." VaporFlex™ vapor barriers are available in both a 15 mil and a 10 mil thick variation, each exceeding the physical requirements of ASTM E1745. VaporFlex® products are available in roll-stock and are seamed in place using rugged VaporFlex™ polymer tape, providing "quick-stick" bonding. We also offer double-sided VaporFlex® moldable sealant tape for attaching to foundations and other structures.

They are available in easy-to-use rolls, 12' x 150' and 15' x 196' respectively, making them easy to transport and install. VaporFlex® vapor barriers are placed underneath or around building foundations to prevent unwanted vapors from entering the building.

VaporFlex® is simply unrolled in place to cover the entire area of the slab to be poured. All



Figure 1. VaporFlex® Standard installation

VaporFlex® Standard Specifications			
Test	ASTM	VaporFlex® 10	VaporFlex® 15
Thickness (Nominal)	D5199	10 mil 0.250mm	15 mil 0.375mm
Baseline Water Vapor Permeance	E154 Section 7	0.044 Perms	0.020 Perms
Permeance After Wetting Drying and Soaking	E154 Section 8	0.057 Perms	0.050 Perms
Tensile Strength After Soaking	E154 Section 9	62 ppi	64.9 ppi
Resistance to Puncture	E154 Section 10	3500 grams	2968 grams
Resistance to Plastic Flow and Elevated Temperature	E154 Section 11	0.067 Perms	0.026 Perms
Effect of Low Temperature Bending	E154 Section 12	0.068 Perms	0.038 Perms
Resistance to Organisms and Substrates in Contact	E154 Section 13	0.050 Perms	0.044 Perms
Roll Dimensions		15' X 196'	12' X 150'

¹ Properties not intended as minimum properties
VaporFlex® exceeds all Class "A" requirements for underground vapor barriers (ASTM E1745)

joints should be overlapped by six inches and then taped in place using VaporFlex® polymer tape. If VaporFlex® is run vertically along the walls of the foundation, tape the barrier in place using double-

VaporFlex® Premium Specifications

Test	ASTM	VaporFlex® Premium 30 mil	VaporFlex® Premium 40 mil
Thickness (Nominal)	D5199	30 mil 0.75 mm	40 mil 1.0 mm
Sheet Density (minimum)	D792	≤ 0.939 g/cc	≤ 0.939 g/cc
Melt Flow Index, G/10min. 190°C	D1238	≤ 1.0	≤ 1.0
Tensile Strength At Break (min. avg)	D6693	99 ppi 17 N/mm	116 ppi 20 N/mm
Elongation at Break	D6693	450%	450%
Tear Resistance (min. avg)	D1004	20 lbs 89N	27 lbs 120N
Puncture Resistance (min. avg)	D4833	67 lbs 300N	90 lbs 400 N
Carbon Black Content	D4218	2-3%	2-3%
Carbon Black Dispersion	D5596	Categories 1-2	Categories 1-2
Stress Crack Resistance	D5397	500 hrs	500 hrs
Oxidative Induction Time	D3895	100 mins	100 mins

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sided VaporFlex® moldable sealant tape. In some cases, concrete can be poured directly onto the VaporFlex® barrier if desired. Check with your Layfield technical representative.

SECTION 2b VaporFlex® Premium Product Overview

VaporFlex® Premium is a 7 layer co-extruded geomembrane barrier with ethylene vinyl alcohol (EVOH) core layer. The EVOH layer is designed to provide an excellent barrier to methane, radon and other volatile organic compounds (VOCs) that exist naturally or as a result of an abandoned industrial/commercial facility suspected of polluting the soil due to hazardous waste. VaporFlex® Premium is tested to a wide range of VOCs including benzene, toluene and xylene and demonstrates the highest level of barrier characteristics. It is offered in 30, 40 and 60 mil thickness that permits its use in a broad range of geo-environmental applications.

EVOH is a flexible thermoplastic copolymer with excellent flex-crack resistance, and very high resistance to hydrocarbons, oils and organic solvents. It also has some of the best barrier properties to gases such as oxygen, methane, radon, nitrogen and carbon dioxide. EVOH is very versatile, making it one of the dominant barrier materials for a broad range of applications. Due to its exceptional chemical resistance properties even a thin layer of EVOH can significantly reduce the transport of gases or liquids across the barrier film. The EVOH film is encapsulated between layers of polyolefin film to protect it from exposed elements.

What is the difference between VaporFlex® Premium and other geomembrane barriers?

Comparisons of the permeation coefficients of organic solvents through EVOH versus other geomembrane liners such as PVC, HDPE and LLDPE suggest that the presence of a very thin layer of EVOH in the geomembrane core can significantly improve the barrier properties. This improves the level of environmental protection and provides an opportunity for EVOH barriers to be used in a multitude of application areas like brownfield sites, primary and secondary containment, landfill liners and capping, and floating odor control/gas collection covers.

SECTION 3a Performance Properties VaporFlex™ Standard

General Design Notes:

VaporFlex® Standard is designed to perform as an effective vapor barrier that impedes the infiltration of moisture and water vapor through concrete slabs and foundations. VaporFlex® is used to discourage mold growth and to help prevent harmful vapors from migrating through the concrete into building interiors. It exceeds all of the standards for a CLASS A vapor barrier as set out by ASTM E1745 requirements. The Class

A is ASTM's highest performance standard for "Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs." VaporFlex® vapor barriers are available in both a 15 mil and a 10 mil thick variation, each exceeding the physical requirements of ASTM E1745.

SECTION 3b Performance Properties VaporFlex® Premium

General Chemical Notes: Permeation Testing

Vapor Management applications often require the use of an impervious barrier (geomembrane) to prevent the migration of hazardous vapors. Geomembranes can be placed under, or around buildings to prevent vapor infiltration, or along the outside of a property line (in a cut-off trench) to prevent migration of vapors onto (or off) site. In all cases where a geomembrane for vapor management is used, Layfield recommends use of a vent to provide a path for any accumulated vapors. Geomembranes are often used as cut-off curtains to prevent migration of solvent vapors into neighboring property. Different geomembranes have characteristic diffusion rates for different chemicals. Layfield can provide chemical compatibility and vapor permeability testing to determine the appropriate vapor barrier material for a specific application. A vapor transmission test is recommended as part of the design process for any vapor management system. This section talks about our permanence testing of liquids and gases through a vapor barrier film.

BTEX testing on VaporFlex® Premium

BTEX is an acronym for hydrocarbon compounds

that include Benzene, Toluene, Ethylbenzene, and Xylenes. BTEX is known to be highly volatile organic compounds (VOC's) and are the main source of ground contamination caused by petroleum related contamination. Because of their small molecular size and high solubility in water and soil, BTEX in their vapor form has the potential to permeate into buildings and other infrastructure that was built on contaminated land that was suspected of polluting due to presence of hazardous chemicals.

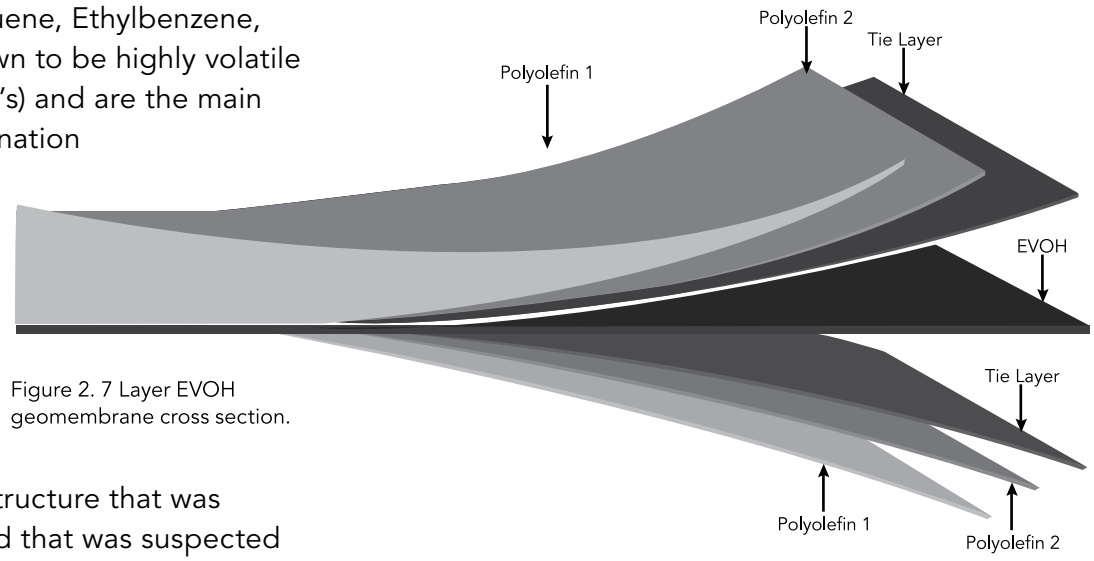


Figure 2. 7 Layer EVOH geomembrane cross section.

The BTEX vapor transmission test was performed on VaporFlex® Premium using the ASTM D814 inverted cup method as a guide. Table 1 presents the vapor transmission results performed on a 30 mil barrier film. The results are based on a total of 28 days exposure to BTEX, the volumetric flow was measured to be less than 0.1 grams/m².hr; the hydraulic conductivity was calculated mathematically using the Darcian permeability.

TCE and PCE Testing (Chlorinated Solvents)

TCE and PCE are acronyms for chlorinated solvents that include trichloroethylene and perchloroethylene, commonly referred to as PERC. Watters and Rowe (2014) investigated the diffusive properties of a 32 mol% 0.015mm-thick EVOH thin-film to TCE in aqueous solution at room temperature. The authors concluded that at room temperature, the permeation coefficient, P_g for TCE was determined at 3.5 x 10⁻¹³ m²/sec. The P_g for toluene through the EVOH barrier was similar

to P_g for TCE, the P_g for toluene was reported at 2.5 x 10⁻¹³ m²/sec. This value is approximately 400 times lower compared to the published values of P_g for toluene through a LLDPE geomembrane which is 1.1x10⁻¹⁰ m²/s (McWatters and Rowe 2010).

Table 1. VaporFlex® Premium BTEX Permeability Coefficients¹

Solvents	Solvent Vapor Transmission	Hydraulic Conductivity
Benzene	0.1 grams/m ² .hr	5 x 10 ⁻¹⁴ m/s
Toluene	0.1 grams/m ² .hr	5 x 10 ⁻¹⁴ m/s
Ethylbenzene	0.1 grams/m ² .hr	5 x 10 ⁻¹⁴ m/s
P-Xylene	0.1 grams/m ² .hr	5 x 10 ⁻¹⁴ m/s
O-Xylene	0.1 grams/m ² .hr	5 x 10 ⁻¹⁴ m/s

¹Tested on our 30 mil VaporFlex® Premium Geomembrane

Layfield tested permeability of 40 mil VaporFlex Premium geomembrane to both TCE and PCE, the result of this 30 day testing was remarkable. For both the chemicals the permeability was measured to be less than 0.1 grams/m². hr.

Contamination from PFOS:

Perfluorooctane Sulfonate is a fluorinated organic chemical, part of a larger family of compounds referred to as Perfluoroalkyl substances (PFASs). One of the primary concerns about PFOS is that they are very persistent chemicals. The PFOS is not easily broken-down or degraded by natural processes. This means that the PFOS once released into the environment will remain and continue to contaminate natural resources. EPA released a statement summarizing concerns around PFOS and PFOA:

“PFOS and PFOA are extremely persistent in the environment and resistant to typical environmental degradation processes as a result they are widely distributed across the higher trophic levels and are found in soil, air and groundwater at sites

Table 2. Comparison of Gas Transmission Rates

Gas	EVOH	HDPE
Nitrogen	0.019	190
Oxygen	0.25	2300
Carbon Dioxide	0.6	17526
Sulfur Dioxide	0.3	21844

Volumetric permeation rate in (cc.20μ/m².day.atm)
Source : Kuraray

across the United States. The toxicity, mobility and bioaccumulation of PFOS and PFOA pose potential adverse effects for the environment and human health.”

The only way to limit the exposure of PFOS into the environment is to contain it. Layfield performed a series of testing on our VaporFlex® Premium to determine the permeation of PFOS, the results are very encouraging. The vapor transfer was measured to be less than 0.1 grams/m².hr.

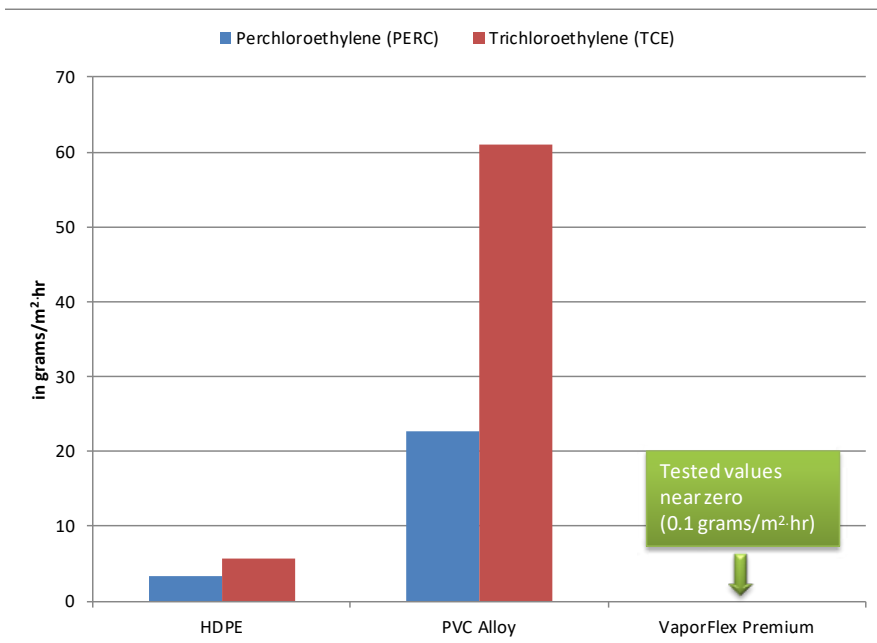


Figure 4. Permeability of PCE and TCE through VaporFlex® Premium.

Methane Transmission

Layfield tested gas transmission to measure the volumetric flow of methane across the vapor barrier. The tests were performed in accordance with ASTM 1434 using 99% methane and test temperature was maintained at 23°C. The methane transmission was measured at 2.72x10⁻⁴ cm³.mil/cm².day which is significantly lower than a 60 mil HDPE geomembrane.

Radon Diffusion

Radon gases occur naturally in the soil, a result of decomposing uranium



Figure 5. VaporFlex® Standard under building liner application. Swedish Medical Center | Issaquah, WA

in the ground. It has been detected across North America; some locations have higher concentration of radon gas than others. It is therefore important to consider a radon gas barrier in conjunction with a properly designed venting system that will limit the movement of radon gas into a building. The radon diffusion coefficient for the VaporFlex® Premium is about 200 times lower than the VaporFlex® Standard barrier.

Oxygen Permeation

EVOH is most well-known and most commonly used for its gas barrier properties, particularly

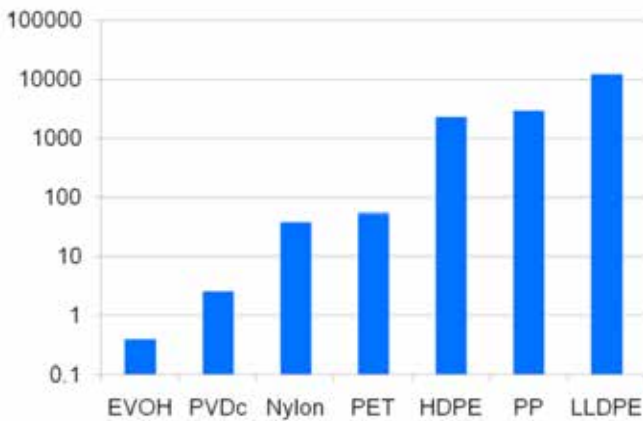


Figure 6. Oxygen Transmission Rate of Films. Measured in cc.20µ/m2.day.atm). Source: Kuraray

as an Oxygen barrier in the food packaging industry. The oxygen barrier properties of EVOH is orders of magnitude higher than commonly used polyolefin resins and even medium barrier polymers like polyamide (PA) and polyethylene terephthalate (PET). Table 2 summarizes some common gases and their transmission rates through the EVOH barrier film.

SECTION 4a Applications: VaporFlex® Standard

Under building liners

Under building liners are geomembranes that are installed under and around the foundation to prevent gases from entering the building. VaporFlex® offers a number of advantages in this application:

- Prevents the infiltration of radon gas
- Prevents moisture from entering a building from the ground, which could cause mold and mildew.



Figure 7. Brownfield site. Image via <http://cityofoceanshores.com> (copyright-free)

SECTION 4b Applications: VaporFlex® Premium

Brownfields

A brownfield is a property, where the redevelopment or reuse may be limited by the presence of hazardous substance, pollutant, or contaminant. According to US EPA, it is estimated that there are more than 450,000 brownfields in the U.S alone. Cleaning up and reinvesting in these properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment. The U.S EPA offers Cleanup grants that provide funding to carry out cleanup activities at brownfield sites. Talk to your Layfield representative about our Vapor Management and Geomembrane systems.

Landfill Liners and Covers

The type of hazardous waste can pose significant

challenges to landfill design and operation. Often in a hazardous waste facility there will be a landfill for solids, and a pond to collect the leachate that may be produced by the landfill. Layfield can recommend the highest quality barrier for these applications. Our VaporFlex® Premium 7 layer EVOH barrier has

very good resistance to landfill leachate and can significantly reduce the volumetric flow of chemicals and solvents into the ground.

The decomposition that occurs inside a landfill system can release noxious odors into the nearby environment affecting local communities. Our VaporFlex® Premium 7 layer EVOH barrier will not only capture the gases but will also restrict its movement across the barrier to reduce or eliminate odors.

Layfield provides geomembrane containment systems for many hazardous waste applications including the



Figure 8. VaporFlex® Premium Defined Sump Cover

containment of liquid or solid hazardous wastes. In hazardous waste applications a double lined system is often needed. Layfield can assist with the design of multiple lined systems including the geomembrane layers, the drainage systems, and the connections to piping and structures.

Odor Control Floating Cover

Floating covers control odors from waste water and manure ponds by preventing the evaporation of volatile elements into the atmosphere. By keeping ammonia, hydrogen sulfide and other odor causing chemicals trapped in the water, the VaporFlex® Premium is an effective floating cover material to prevent odors from leaving the impoundment. When considering an odor control cover Layfield has a number of designs that can address the operating needs of the pond. Call your local Layfield office to discuss your next VaporFlex® Premium Odor control cover.

Geofoam Protection

Expanded Polystyrene (EPS) Geofoams are light weight and are commonly used in transportation applications as an infill material to fast track construction and provide significant savings when replacing soil systems. The only downside to using EPS is their potential to break down when exposed to hydrocarbons and mineral oils and therefore needs to be protected. Some common solvents that can dissolve geofoam include:

- Gasoline
- Diesel
- Other Petroleum Based Fuel
- Organic Fluids



Figure 9. Geofoam blocks in use at the Alberta Legislature parkade in Edmonton, Alberta. Photo: EPS Molders Inc

Layfield can prefabricate large panels to cover the EPS foam blocks to speed the time of installation. More on prefabrication in the next section.

SECTION 5 Prefabrication VaporFlex® Premium

Prefabricated geomembrane liners are usually made of flexible liner materials that are thermally welded together to form large geomembrane panels that can be deployed very quickly in the field. Our 30 and 40 mil VaporFlex® Premium panels can be manufactured in a controlled environment with high quality seams. Prefabricated panels reduce the number of field seams and significantly improve the overall efficiency and economics. Typically, prefabricated panel require approximately 60-80% less field seams compared to field fabrication.

Advantages of factory fabrication:

- Seams welded in a controlled environment
- Reduction in labor & construction costs
- Large prefabricated panels, 30 mil– up to 10,000 lbs (75,000 ft²)

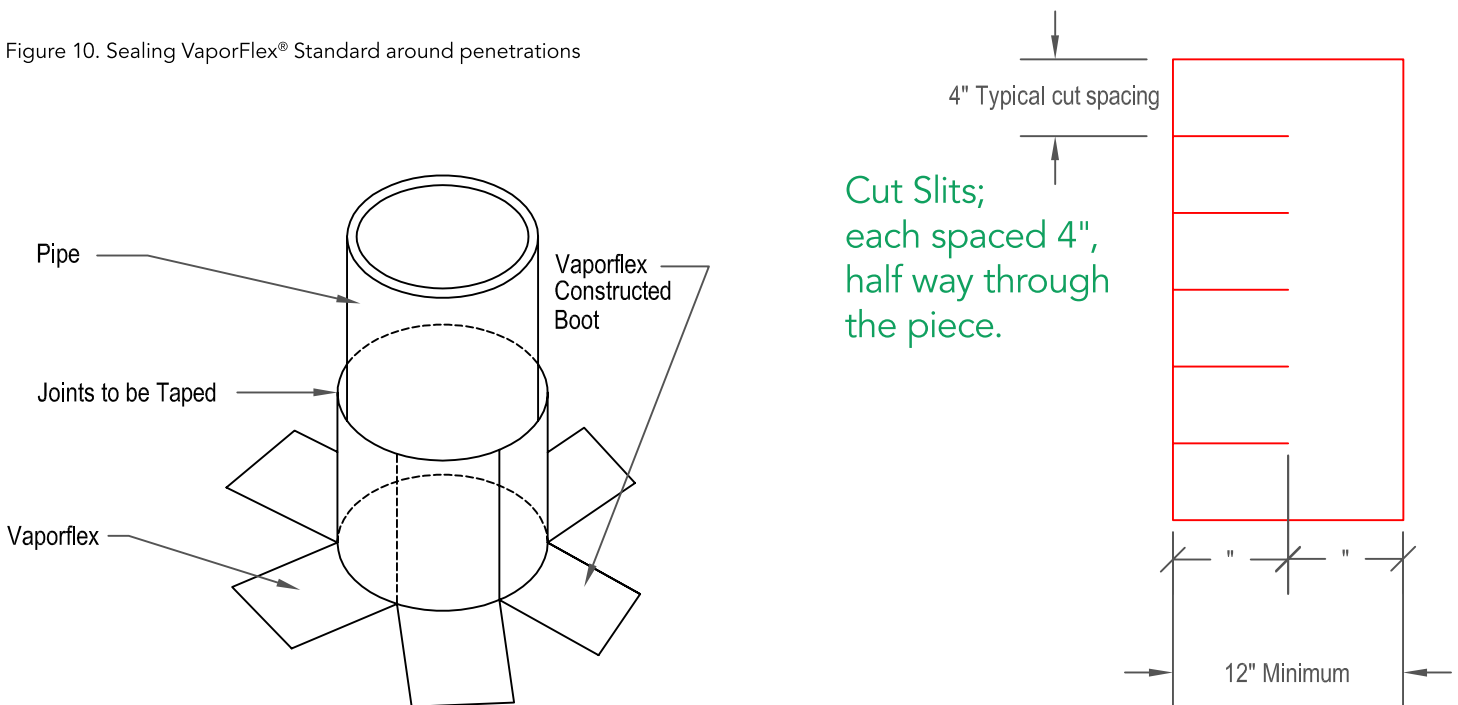
SECTION 6a Installation Instructions: VaporFlex® Standard

1. Where appropriate, install VaporFlex® Standard vapor barriers in accordance with ASTM E 1643-98 (Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs)
2. The granular base needs to be compacted and graded in accordance with the projects plans & specifications. The base should be free of all protruding objects and debris.
3. VaporFlex™ Standard should be unrolled parallel to the direction that the concrete will be poured. After unrolling, pull out the folds to the full roll width. The vapor barrier should be left deployed in a relaxed state. Overlap all seams a minimum of 6" and continuously seal the overlap with 4" VaporFlex® Standard Tape. The

VaporFlex® Standard needs to be lapped over footings or sealed to the foundation wall. All other penetrations like columns and utilities need to also be sealed.

4. Seam surface area should be clean and dry to optimize the integrity of the seam adhesion.
5. Care needs to be taken at all times to protect the VaporFlex® Standard from damage during the installation of the reinforcing steel, utilities and during the concrete pour. It is important not to drive stakes through the VaporFlex® Standard. In the event a repair is required on the VaporFlex® Standard as a result of damage done during one of these processes, ensure the repair patch material is the same VaporFlex® Standard material. All repair patches must have round edges and overlap the repair area by a minimum of 150mm (6"). Seal the patch with VaporFlex® Standard tape.

Figure 10. Sealing VaporFlex® Standard around penetrations



Sealing VaporFlex® Standard Around Penetrations

Option 1: Constructing Boots from VaporFlex® Material

1. Cut a piece of VaporFlex® Standard at least 12" wide and long enough to wrap around the circumference of the pipe at least 1.5 times
2. Make cuts in the VaporFlex® Standard every 4" along the length, if the piece is 12" wide cut the slits into the piece 6", or halfway across the material.
3. Wrap the solid section of the VaporFlex® Standard around the pipe, fanning out the 4" slit sections at 90 degrees over the installed vapor barrier.
4. Tape the boot in place to the installed vapor barrier, and to the penetrating pipe, using VaporFlex® Standard tape.

Option 2: Purchase Prefabricated Pipe Boots

Layfield can offer preformed pipe boots, to seal around penetrations from 2" to 12" diameter pipes.

Contact your Layfield Representative for more information on prefabricated pipe boots.



Figure 11. Layfield truck carrying prefabricated geomembranes for delivery

SECTION 6b Installation Instructions: VaporFlex® Premium

Installation (Vapor Management, under building liners)

Where appropriate, install VaporFlex® Premium in accordance with ASTM E 1643 which is Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. The subgrade needs to be compacted and graded in accordance with the projects plans & specifications. VaporFlex® Premium needs to be protected from damage during the installation of the reinforcing steel, utilities and during the concrete pour. In the event a repair is required on the VaporFlex® Premium as a result of damage, ensure the repair patch material is the same VaporFlex® Premium material. All repair patches must have round edges and overlap the repair area by a minimum of 150mm (6"). VaporFlex®



Figure 12. Geomembrane Gas Barrier

Premium geomembrane is flexible enough to be prefabricated at our facility into large panels. The prefabricated panel is accordion folded, rolled on a core, and delivered to the job site secured to a pallet. Prefabricated panels can often cover a small project with a single panel. Please download a CSI specification on VaporFlex™ Premium from our website.

Installation (Containment Applications)

Layfield's VaporFlex® Premium liner is flexible enough to be prefabricated at our facility into large panels (up to 40,000 square feet at 30 mil). Prefabricated panels are accordion folded, rolled on a core and delivered to the job site secured to a pallet. Unfolding instructions and dimensions are marked on the individual liner panel. Each panel is wrapped

in an opaque, weather resistant covering suitable for shipment and storage. Prefabricated panels can often cover a small project with a single panel.

The prepared surface should be uniform, well compacted, and free of sharp rock fragments or stones, large stones and other deleterious matter such as tree roots, construction debris and metallic objects. The surface should not have any natural or foreign object that protrudes above the surface of the subgrade. Installation of the geomembrane shall be performed in a logical sequence. All work shall be in accordance with the project drawings, specifications, and quality control requirements. Please download a CSI specification on VaporFlex® Premium from our website.

SECTION 7 ASTM E 1745 Class A VaporFlex™ Barrier Selection

Why the ASTM Standard

In 1996, ASTM recognized the need for standardizing vapor barriers placed below slab by enacting ASTM E1745. The standard assures specific vapor retarders must meet minimum values to ensure that they meet high performance standards; and that the vapor barrier performs as intended as per the design life of the building or structure. The CLASS A standard provides the best characteristics of low permeability, resistance to puncture, tearing and chemical and /

PRODUCT/CLASSIFICATION	WATER VAPOR PERMEANCE (E 154, Section 7 or F 1249), max	TENSILE STRENGTH (E 154, Section 9), min	PUNCTURE RESISTANCE (D 1709, Method B), min	CLASS		
				A	B	C
Class A Requirement	.10 Perms	45.0 lb/in	2200 grams	●		
VaporFlex™ Standard 15 mil	.02 Perms	65.0 lb/in	2968 grams	●		

Figure 13. Vapor Retarder Comparison - Based on ASTM E-1745-11 Requirements



Figure 14. VaporFlex™ Standard underbuilding application.

or environmental attack.

VaporFlex™ Standard CLASS A Vapor Barrier

VaporFlex™ is extremely durable to ensure it withstands the rigors of the installation. The true permeability of a vapor barrier is the laboratory test results minus any installation damage. This is why the VaporFlex™ has been designed to have extremely high tensile and more importantly, high puncture resistance. VaporFlex™ vapor barriers are produced from the highest quality North American produced polymer resins. Virgin polymer resins also ensure the VaporFlex™ is highly resistant to organisms and substrates that will come in contact with the vapor barrier, resistant to cold and high temperatures and offer very low permeability values. There are NO reprocessed or recycled materials in any of the VaporFlex™ products.

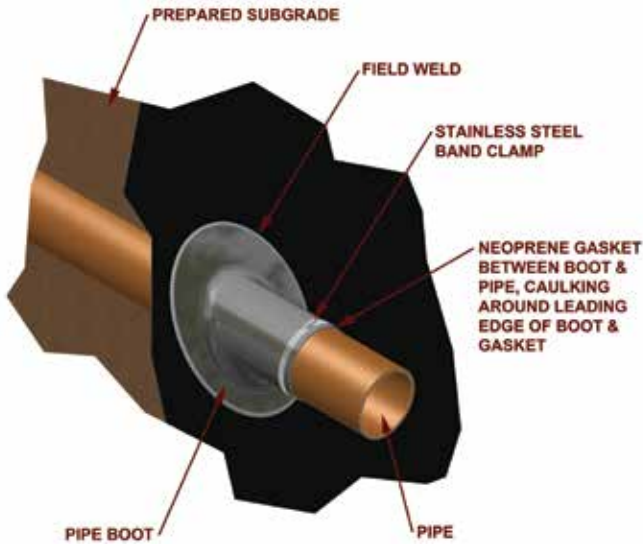
Selecting and Specifying a CLASS A Vapor Barrier

Specifying and selecting a CLASS A vapor barrier brand is very important. Many of the company's that own a brand name vapor barrier do NOT manufacture their own product. Rather, they subcontract out the manufacturing to various plastic producers across the country. The brand's owner then surrenders their control over the products QA/QC to the individual manufacturing plant(s). This leaves the quality assurance and quality control testing in the hands of the manufacturer of the product, not the company that owns the brand. This can lead to inconsistent product quality from one production run to another, and from the one manufacturing plant to the other. Layfield manufactures 100% of all the VaporFlex™ vapor barrier produced ensuring the manufacturing of every single roll is completed with strict adherence to a registered quality management system that meets the requirements of the ISO 9001:2015 standard. Layfield can produce a complete audit trail from resin specifications to production run test results, in addition to the accredited third party testing.

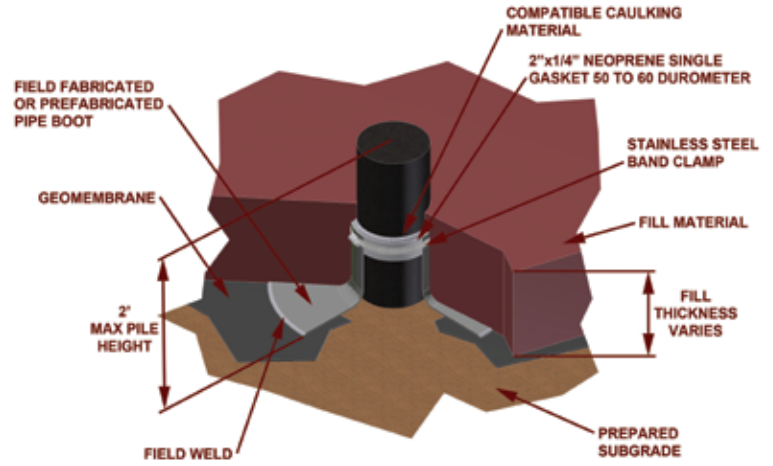
SECTION 8

VaporFlex Premium Typical Drawings

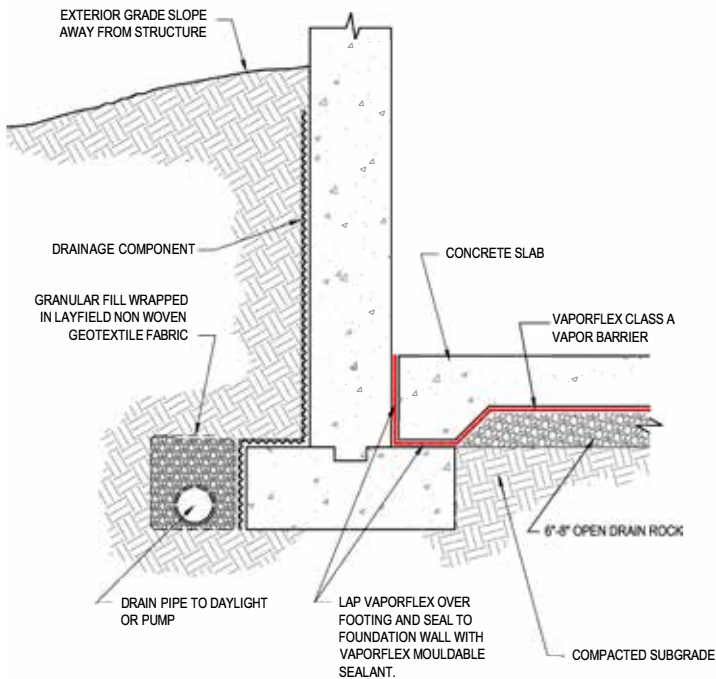
Pipe Boot



Piling Support



Slab on Grade



Thermoformed Boot

