TerraShield®
Metalized Nitrile
Contaminant Vapor Barrier

Technical Data Sheet

Description

TerraShield® is the premier under-slab contaminant vapor intrusion barrier designed to eliminate contaminant vapors at sites with environmental impacts.

The patented TerraShield system is comprised of three defined layers to create a robust, redundant, seamless membrane: TerraBase+™, Nitra-Core™, and Land Science Protection Fabric™. TerraShield is an advancement over single-sheet membranes and traditional spray-applied composite vapor barriers due to:

1. the excellent protection provided by the metalized geomembrane, TerraBase+
2. the inclusion of Nitra-Core, the most chemically resistant spray-applied core available

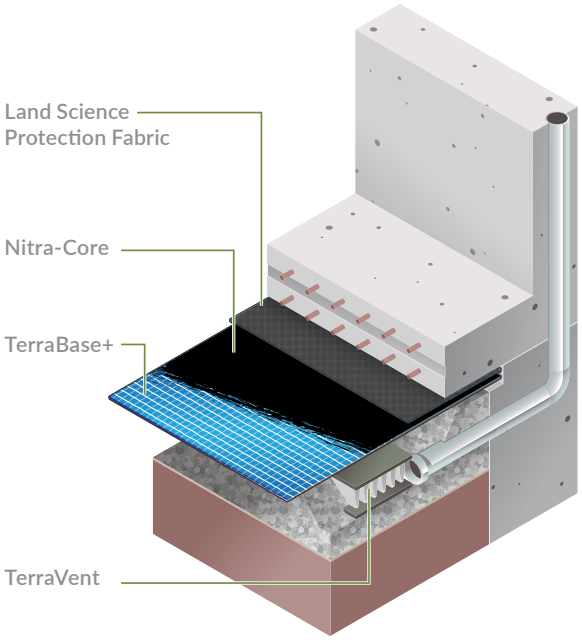
These proprietary features offer the greatest resistivity to contaminant vapor permeation through the building foundation, while remaining practical for construction timelines and budgets. The installation of TerraShield usually occurs after the site substrate has been prepared and the utilities placed, and prior to concrete slab placement.

Developed to meet and exceed the most stringent regulatory requirements across the nation, TerraShield is proven to protect building occupants from chlorinated solvents, petroleum compounds, methane, radon, and other volatile organic compounds by physically encapsulating the building foundation to prevent contaminant migration through the concrete slab.

TerraShield System Summary

System Thickness:	65 mil, 125 mil with protection fabric			
Components:	Venting System[1]	Base Layer	Middle Layer	Top Layer
Product Name:	TerraVent	TerraBase+	Nitra-Core	LS Protection Fabric
Component Thickness:	1”	25 mil	40 mil	50 mil (Approx.) (8 oz/sy)

1. Venting system is an optional system component



Advantages

Chemical Resistance

TerraBase+, the metalized geomembrane base layer of TerraShield, offers over 100x greater protection to VOC permeation versus traditional polyethylene base layers.

Speed of Installation

Construction friendly, with a nominal, uniform spray-applied thickness of 40-mil due to the chemically-resistant, nitrile-modified asphalt used in Nitra-Core.

Durable

Puncture resistant with high tensile strength to withstand construction activity post-installation.

Proven

Verified by extensive third-party testing to exceed the most stringent regulatory requirements for vapor intrusion barrier systems.

TerraShield System Properties

Property	Test Method	Typical Value
Tensile Strength[1]	ASTM D751	131 lbs
	ASTM D7004	136 lbs
Elongation[1]	ASTM D751	19%
	ASTM D7004	18%
Puncture Resistance	ASTM D4833	52 lbs
Water Vapor Transmission	ASTM E96[3]	0.0014 grains/(hr·ft^2)
Water Permeance	ASTM E96[3]	0.0023 US Perms
Methane Gas Permeance	ASTM 1434[4]	<0.12 mL(STP)/(m^2·d·atm) [5]
Benzene Diffusion Coefficient	GeoKinetics[2]	3.4 x 10^{-18} m^2/s
PCE Diffusion Coefficient	GeoKinetics[2]	1.8 x 10^{-17} m^2/s
Radon Permeability	ISO/TS 11665-13[6]	<0.4 x 10^{-12} m^2/s [5]

1. Values are an average of the machine direction and the transverse direction test results.
2. A method comparable to ISO 15105-2, performed by GeoKinetics, Inc., Irvine, CA.
3. Tested by equivalent method, EN1931.
4. Tested by equivalent method, ISO 15105-1.
5. Test results were below the method detection limit.
6. Test method equivalent to K124/02/95

Design Considerations

TerraShield is generally implemented at sites with moderate to high vapor intrusion risk where a best-in-class, high-performance solution is desired to prevent vapor exposure. Common applications include sites with sensitive receptors, such as schools, senior living communities, and hospitals, or sites with exceedances to residential or commercial screening levels.

TerraVent can be implemented in an active or passive mitigation capacity in conjunction with TerraShield to alleviate the buildup of vapors beneath the building structure. Combining a sub-slab ventilation network in the permeable substrate with TerraShield offers the highest level of protection from contaminant vapor intrusion.

Service & Support

Land Science representatives are available for site data analysis, mitigation system recommendations, barrier and venting design support, and budgetary estimates. Site conditions, project objectives, and regulatory requirements will dictate which mitigation solution is appropriate.

Weather Limitations

- Nitra-Core should be sprayed at temperatures >45°F. Contact Land Science for requirements in colder temperatures.
- Nitra-Core should not be sprayed when raining or during weather conditions that create ponding water on the membrane.
- Any ponding water on the surface of TerraBase+ needs to be removed prior to applying Nitra-Core.

Warranty

Land Science offers industry-leading warranty options for a full-suite of vapor intrusion barrier systems. All installations come with a 1-year material warranty free of charge. To qualify for extended warranty terms, the project must be reviewed and approved by Land Science prior to any product installation by a Land Science Certified Applicator.

TerraShield extended warranty options include Material and System warranties up to 30 Years. Contact Land Science for more information to meet your site's warranty requirements.

1011 Calle Sombra, San Clemente, CA 92673 Phone: (949) 481-8118 landsciencetech.com