SPECIFICATION
SUPPLEMENT

G-17

Electronic Leak Detection (ELD) Systems

July 2026

The information contained in this supplement serves as criteria for Specifiers and Authorized Contractors regarding the design and installation of Versico Roofing Systems and related products. Additional information essential for the design and installation of the Roof Systems mentioned herein are also included in the respective Specification for each Roof System and in the Design Reference Section of the Versico Technical Manual. Specifiers and Authorized Contractors are advised to reference all applicable sections.

A. Introduction

Verifying the watertightness of roofing is important, especially if it is to be covered with pavers, ballast, or a vegetated roof assembly. This verification is a field quality-control measure beyond the scope of visual inspections for issuance of a warranty. A common practice used is flood testing the roof using ASTM D5957 as a standard guide. However, using the flood test method can introduce large amounts of water to a new roof assembly if there is a serious leak. Electronic Leak Detection uses a small amount of water, or no water at all, depending on the method used, so the introduction of large amounts of water is not an issue. The advantages of low-voltage electrical conductance testing over traditional flood testing are its capability of providing leak detection throughout the life of the roofing, precisely locating leaks, and with some testing methods, the ability to test sloped roofs and vertical walls. Thereby making it a Quality Assurance test, at time of installation and an Evaluation or Forensic Tool for investigating leaks or breaches in the roof membrane throughout its service life, when the membrane is exposed.

Electronic Leak Detection (ELD) - A non-destructive test that uses a brush, broom, roller, platform, or probes, along with low- or high-voltage electrical current, to find breaches, holes, and seam voids in the roof membrane or flashings by completing a circuit with the electrical charge. In low-voltage ELD testing, A breach-free membrane will block any water and therefore, any electrical current. If a leak is present, the water will make its way through the membrane and must touch an electrically grounded conductive substrate directly below the membrane. This allows an electrical circuit to be completed and the testing equipment and technician to accurately pinpoint the membrane breach, limiting the repairs needed to the areas where damage has been identified instead of replacing or repairing the entire roof.

Electronic leak-testing methods are outlined in **ASTM Guide D7877-14 "Standard Guide for Electronic Methods for Detecting and Locating Leaks in Waterproofing Membranes"** which lists the four different ELD test methods. Those four test methods are: **Low-Voltage Scanning Platform, Low-Voltage Vertical Roller, Low-Voltage Electronic Field Vector Mapping, and High-Voltage Spark or Holiday Testing**. All four of the ELD test methods require the same basic requirements: A conductive substrate must be present directly below the membrane. A valid ground connection must be provided. The membrane must be exposed. The roof system must have a continuous, unbroken electrical path from the top of the membrane to the conductive substrate below.

1. **Low-Voltage Scanning Platform Testing** is a specific system which uses a small scanning platform, called IntegriScan™, a proprietary system by Detec Systems. This system is described in ASTM D7877 as well as in ASTM D8231 “Standard Practice for the Use of a Low Voltage Electronic Scanning System for Detecting and Locating Breaches in Roofing and Waterproofing Membranes”. The platform is approximately 18 by 24 inches (457 by 609 mm) and incorporates a perimeter wire loop of chains that hang from the platform and make contact with water on the roof surface, and a separate line of chains located in the center of the platform. Both series of chains are connected to a low-voltage power source. The platform is moved along the surface of the roof

membrane to detect breaches in the roof membrane.

When utilized with a conductive primer directly below the membrane, this system works with electrically conductive roof materials such as black EPDM, which contains carbon black, or with roof membranes that have aluminized protective coatings, commonly used on modified bituminous membranes.

2. **Low-Voltage Vertical Roller Testing** is a specific system which uses a Vertical Scanning Unit (VSU Roller) as part of IntegriScan™, a proprietary system by Detec Systems. This system is described in ASTM D7877 as well as in ASTM D8231 “Standard Practice for the Use of a Low Voltage Electronic Scanning System for Detecting and Locating Breaches in Roofing and Waterproofing Membranes”. The VSU Roller utilizes a 3/8” nap by 9” roller. The VSU Roller is moved along the vertical surface of the roof membrane or flashings to detect breaches in the roof membrane or flashings.

3. **Low-Voltage Electronic Field Vector Mapping (EFVM) testing** works by grounding a conductive roof deck, such as steel, beneath a nonconductive roof membrane and locating places where the electric field goes through the roof. This process is accomplished by dampening the roof and placing an uninsulated wire loop around the perimeter of the area to be tested and around any grounded objects to isolate the testing area. The wire loop is connected to a low-voltage pulsating generator that emits a one second 40-V charge every three seconds, creating a momentary electric field between the wire loop and the grounded roof deck. The roof membrane acts as an insulator between the electrified wire loop and the roof deck. Electrical charges over the moist membrane surface will be random unless there is a discontinuity or "leak" in the membrane. If there is a leak, a directional current is created that can be followed to the leak using a potentiometer that is connected to two probes that make contact with the roof surface. For conventional and nonconductive roof decks, such as wood, a conductive medium must be built into the roof assembly. Common mediums include welded stainless-steel mesh for adhered roof systems, a conductive primer for adhered systems, aluminum screen for loosely laid roof systems, and a conductive fabric for use with loosely laid and mechanically fastened roof systems.

   Additionally, this testing method will not work with an electrically conductive roof material such as black EPDM, which contains carbon black, or with roof membranes that have aluminized protective coatings, commonly used on modified bituminous membranes. Continuous water contact must be maintained with the perimeter wire, the testing probes and through the breach in the roof membrane to the conductive material (metal roof deck or conductive medium), or the breach will not be detected.

4. **High-Voltage Spark or Holiday testing** uses 1000- to 30,000-Volts od DC power and does not require a wet membrane or perimeter wire loop. The system uses an electrically charged metal "broom" connected to the power source, which is grounded to a conductive roof deck or a conductive medium. When the metal broom passes over a discontinuity in the dry roof membrane, the electrical circuit is completed, and an audible sound and a visible spark is generated by the testing equipment.

   Additionally, this testing method will not work with an electrically conductive roof material such as black EPDM, which contains carbon black, or with roof membranes that have aluminized protective coatings, commonly used on modified bituminous membranes. The roof membrane must be completely dry for this testing method to work. Due to the higher voltage used, more false positives have been reported and there is a greater injury risk associated with testing. Additionally, some concern has been expressed with the concept of dragging a wire broom across roof membranes and effect this friction may have on the membrane.

B. Description

The focus of this Spec Supplement is for Electronic Leak Detection with the use of Detec Systems’ TruGround Conductive Primer. Versico has collaborated with Detec Systems to offer many Factory Mutual (FM) rated and warrantable roof assemblies that include Detec's TruGround Conductive Primer. Detec Systems' patented TruGround

Conductive Primer is an easy to apply conductive medium that is needed to effectively test conventional roofing assemblies for breaches, holes, and seam voids using electronic leak detection (ELD) methods. ELD has become the preferred option for ensuring a watertight membrane on overburden installations and other critical building projects.

Detec's TruGround Conductive Primer is brush- or roller-applied to the substrate prior to adhesive and membrane application. Once the TruGround Conductive Primer has dried (typically 30 minutes), the bonding adhesive can be applied, and the membrane installed like any other roof system.

For leak detection to be accurate, the conductive medium must be installed directly below the roofing membrane. Alternative conductive mediums often raise concerns regarding membrane adhesion when placed directly below the membrane as required per ASTM D7877. These concerns often lead to improper placement of the conductive medium below a coverboard or insulation which invalidates the ELD testing.

Versico has conducted testing with FM as well as other 3rd party testing agencies to vet roof system performance when TruGround primer is added to the assembly.

The following roof assemblies have been tested and approved by FM with the addition of TruGround. These assemblies are eligible for the same FM rating as they would without TruGround. Contact Versico for associated RoofNav numbers.

FM Approvals		
Membrane Type	Adhesive	Substrates
EPDM	CAV-GRIP 3V	SecurShield Polyiso SecurShield HD Polyiso SecurShield HD Plus Polyiso Versico ImpactR-7™ Dens Deck Prime SECUROCK DEXcell DEXcell FA DEXcell FA VSH DEXcell Glass Mat Roof Board
TPO	CAV-GRIP 3V	SecurShield Polyiso SecurShield HD Polyiso SecurShield HD Plus Polyiso Versico ImpactR-7™ Dens Deck Prime SECUROCK DEXcell DEXcell FA DEXcell FA VSH DEXcell Glass Mat Roof Board
PVC	Low-VOC PVC Bonding Adhesive	Versicore Polyiso SecurShield Polyiso Versico ImpactR-7™ SecurShield HD Polyiso SecurShield HD Plus Polyiso

The following roof assemblies have been tested and approved by FM with the addition of TruGround, but are limited to an FM 1-90 rating. Contact Versico for associated RoofNav numbers.

FM Approvals		
Membrane Type	Adhesive	Substrates
VersiFlex PVC	Hydrobond Bonding Adhesive	VersiCore Polyiso SecurShield Polyiso SecurShield HD Plus Polyiso Versico ImpactR-7™ Dens Deck Prime SECUROCK DuraStorm VSH DEXcell DEXcell FA DEXcell FA VSH DEXcell Glass Mat Roof Board

For projects that are not FM insured, Versico approves and warrants the use of Detec TruGround in all current roof assemblies. Versico warrants that the use of TruGround within the roof assembly will not detrimentally affect the performance of the roof assembly. Roof assemblies using TruGround can achieve the same uplift and warranty terms as the same assembly would be eligible for without TruGround.

C. Quality Assurance

1. The specified roofing system must be installed by a Versico Authorized Roofing Contractor in compliance with drawings and specifications as approved by Versico.

2. Roof system must be inspected and approved by a Technical Representative of Versico prior to Overburden System (Roof Garden, Pavers or Ballast) installation.

3. Do not install this assembly before the concrete deck has reached its' initial structural strength. Project Engineer must be consulted prior to job start-up.

D. Submittals

1. Shop drawings must be submitted to Versico by the Versico Authorized Roofing Contractor along with a completely executed Copy-A Job Approval Request for approval. Approved shop drawings are required for inspection of the roof and on projects where on-site technical assistance is requested.

2. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

E. Products

1. In addition to the products listed below, products listed in "Part II" of the Versico Thermoset/Thermoplastic/VersiFleece Roofing System Specification can be used as part of the Overburden System (Roof Garden, Pavers or Ballast) installation.

    a. Detec TruGround Conductive Primer - is a water-based, liquid-applied, electrically conductive primer that enables effective electronic leak detection (ELD) testing of conventional roof assemblies. Detec TruGround is brush- or roller-applied in a single-sided application to any properly prepared, non-conductive horizontal or vertical surface such as plywood, insulation, or gypsum cover boards. TruGround is compatible with high- and low-voltage ELD testing methods listed in ASTM Standard Guide D7877 and complies with ASTM Standard Practice D8231. TruGround is UL Listed and FM Approved in several Versico roofing assemblies.

F. Execution

Follow current specifications for installing roof membranes and seaming per specific membrane. [VersiGard (EPDM), VersiWeld (TPO) or VersiFlex (PVC/KEE HP)].

G. Installation

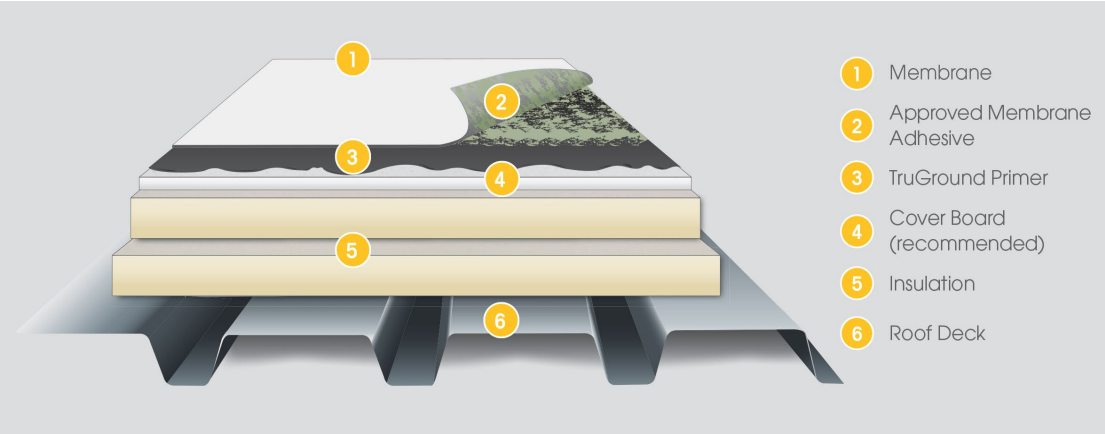
1. Start by liberally applying TruGround to the substrate T-Joints using a paint brush, this ensures electrical continuity between boards. If large gaps, those exceeding 1/8", are present between boards, apply seam tape to the T-Joints to act as a bridge, connecting the boards together. Then, when applying TruGround to the substrate boards (see step 2) ensure that it is also applied over the seam tape connecting the boards. Seam tape may need to be applied at vertical penetrations as well, if the gaps are too large to bridge with TruGround.

2. Apply a thin coat of TruGround over the entire project area using a 3/8" nap roller. If the surface is black, TruGround has been applied at the acceptable thickness. Coverage rate is typically 1250 square feet for most non-porous substrates.

3. Continue TruGround up and onto all metal/grounded penetrations a minimum of 1", not to exceed the height of the flashing. Testing equipment will be connected to these penetrations while conducting the ELD tests.

4. Once TruGround is dry to the touch (typically 30 minutes), proceed with installing the roofing system as outlined in the assembly tables within this Spec Supplement and in accordance with Versico published Specifications for the specific membrane type.

H. Associated System Diagram



Typical Roof Assembly with Conductive Primer

End of Section

Copyright 2026 Versico
Versico, VersiGard, VersiWeld, VersiFlex and ImpactR-7 are Trademarks of Versico

TruGround is a Trademarks of Detec Systems

DEXcell is a trademark of National Gypsum

This specification represents the applicable information available at the time of its publication. Owners, specifiers and Versico Authorized Roofing contractors should consult Versico or their Versico Independent Sales Representative for any information, which has subsequently been made available.
Review the appropriate Versico warranty for specific warranty coverage, terms, conditions and limitations.