



Pin point leak detection using  
Electric Field Vector Mapping

# The revolutionary EFVM leak detection

Now available in New Zealand, the EFVM® leak detection system makes flood testing of waterproofing membranes a thing of the past. Initially introduced to the United States market in 2001, the EFVM® System is now used extensively around the world (see last page). Waterproofing membrane defects can occur during or after installation; e.g. mechanical damage caused by others, workmanship defects, material defects, design faults, weather related defects or membrane deterioration.

EFVM® provides an efficient and highly accurate leak detection solution.

## What is EFVM®

EFVM® is a low voltage test method that creates an electrical potential difference between a non-conductive membrane surface and a conductive substrate, which is earthed or grounded.

By applying water on the membrane surface and using the water as a conductive medium, an electric field is created and a breach in the membrane creates a vector (ground fault connection). The EFVM® technician reads the electric flow travelling across the membrane, mapping the breaches with pin point accuracy.

## Advantages of the EFVM® testing system

- Accurate pinpointing of membrane breaches
- Non-destructive to the membrane
- Can be performed on sloped structural decks
- Eliminates removal of the overburden to locate a membrane breach
- Membrane performance can be monitored during its lifespan through the overburden
- Membrane defects can be repaired and retested without delay to the construction schedule
- Limited use of water required for the EFVM® test
- EFVM® can be performed during inclement weather
- Overburden installation can proceed immediately after or during the EFVM® test.

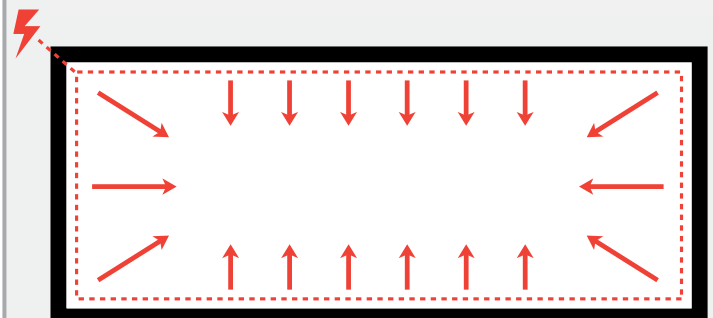
## Where EFVM® can be utilised

- Garden roofs
- Roofs with ballast
- Roofs with paving stones
- Exposed membrane roofs
- Insulated and Non-insulated roof systems
- Inverted roof systems
- Plaza deck roofs
- Parking garages/Parking decks
- Ponds/water container liners
- Swimming pools



## How EFVM® works

The EFVM® equipment delivers a pulsating potential difference between the roof surface and the structural deck. A watertight membrane isolates the potential difference from connecting. However, breaches in the membrane will cause an electrical connection to occur. The technician reads the directional flow of the current with sensors and locates the point of entry with pinpoint accuracy.



Small electrical pulses are directed into the membrane.  
The electricity is searching for a ground earth connection.

# ction system: accurate and efficient



Breaches in Torch-on Membrane



Breaches in Hot Rubber Membrane

## When EFVM® can be utilised

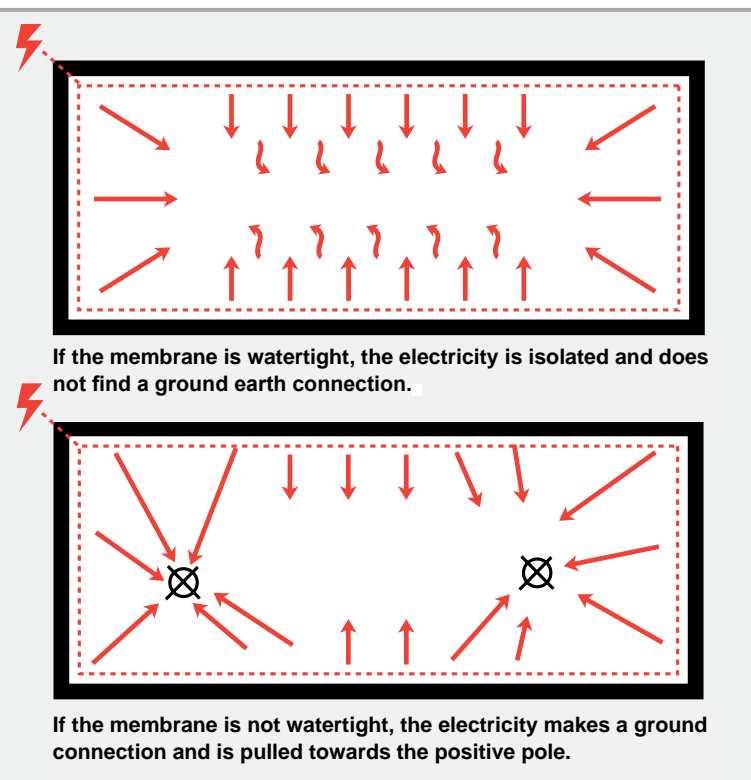
- Upon completion of the installation or repair of the waterproofing membrane
- Prior to the expiration of warranted membranes
- Annually, to detect any membrane defects at an early stage to prevent costly water damage.

## Technicians reports

Our trained technicians complete the EFVM® integrity test conducting a visual inspection of wall junctions, perimeter details and membrane penetrations, then provide CAD drawings, picture documentation and a written report detailing the location of the breaches.



Breach in PVC Membrane





# Greenroofs

EFVM is unique in its ability to test the integrity of waterproofing membranes without the need to remove the overburden.

This non-destructive method is important for greenroof systems because the waterproof membrane is effectively fully submerged in water, severely testing the integrity of the installation.

Many greenroof developments now utilise EFVM testing prior to and after overburden placement. EFVM has been successfully utilised on roofs with soil overburden more than **1 metre deep !!**





# Greenroofs



Greenroof developments now utilise EFVM testing prior to and after overburden placement.



# Vector Grid

EFVM testing requires that the membrane being tested is laid on a conductive and earthed substrate. Reinforced concrete buildings and structures are earthed through the reinforcing steel and thus are easily tested.

Modern lightweight construction materials which are non-conductive, such as plywood and fibre-cement sheets, require ILD Vector Grid installed on the substrate prior to the membrane being placed. Should the roof system include insulation (Thermal or Acoustic) the Vector Grid is placed directly beneath the membrane to allow ILD to undertake an EFVM test.



- ① Overburden / Garden
- ② Geotextile layer
- ③ ILD Vector 9 Cable
- ④ Waterproofing layer
- ⑤ ILD Vector Grid
- ⑥ ILD Connection Box
- ⑦ Insulation buildup
- ⑧ Damp proofing
- ⑨ Primer or Separation layer
- ⑩ Concrete Roof / Deck

When the roof is of lightweight design with no overburden the buildup would read:

- ③ ILD Vector 9 Cable on surface
- ④ Waterproofing layer
- ⑤ ILD Vector Grid
- ⑩ Plywood / lightweight roof deck



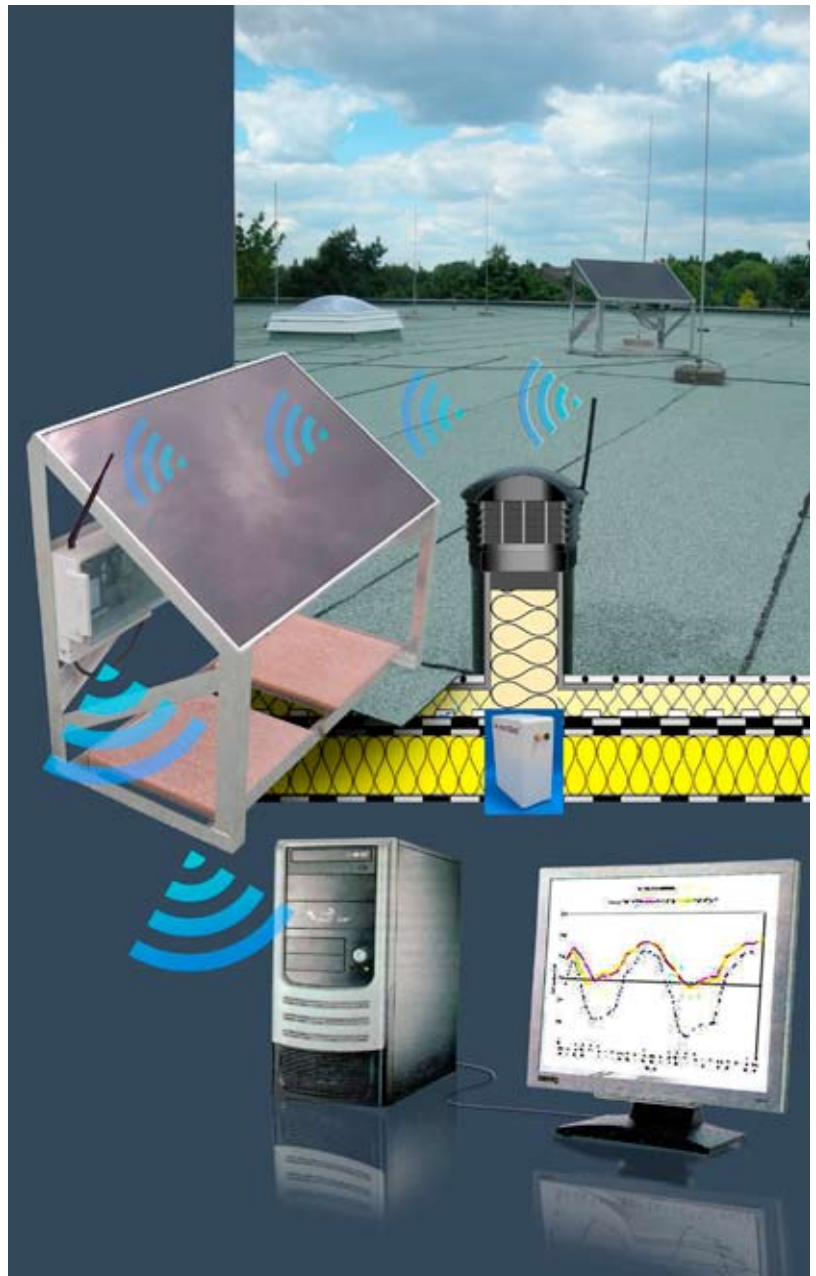
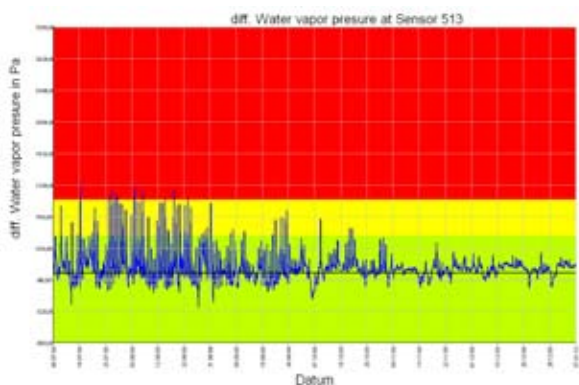
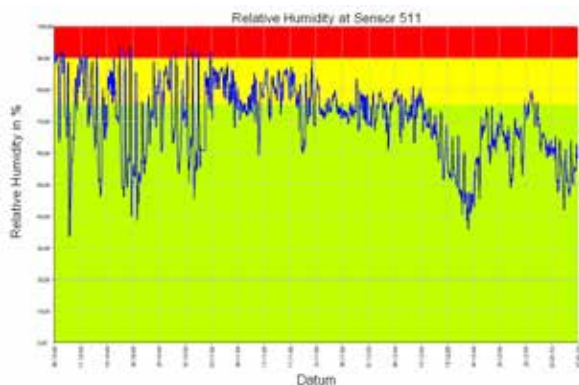
# The FUTURE of Roof Testing

**PROTECTSYS®** is a remote, constant roof cavity monitoring system.

The system incorporates battery powered sensor boxes which transmit results to a solar powered central hub. This hub collates information from sensors and sends it to an ILD central computer where the information is assembled and generated into regular reports. Should the roof system suffer a failure, the building owner is contacted immediately.

Installation of Protectsys® is an investment in the structure, providing a secure, monitored roof system giving certainty to building owners, builders and membrane placers for the life of the building.

**PROTECTSYS®**







EVFM® is trusted internationally

#### International Associates

Australia  
Austria  
Brazil  
Canada  
Denmark  
Germany  
Italy  
Poland  
Switzerland  
U.S.A Northeast  
U.S.A Northwest

#### International Projects

##### Canada

- The Canadian Trust Museum
- Canada Trust Tower
- Canadian Space Agency
- NAV Canada
- Vancouver Convention Centre
- University of British Columbia
- Bank of Nova Scotia
- GE Structures
- Canadian Forces Base
- Petawawa
- Ministry of Natural Resources

##### USA

- Empire State Building
- Harvard University
- Clinton Library
- Social Security Administration Building
- Clorox Company
- Yale Cancer Centre
- Xerox
- Four Seasons Hotel
- Ministry of Transportation
- Home Depot

#### New Zealand Projects

- Aotea Square redevelopment
- Metropolis
- Auckland High Court
- The Connaught
- Auckland Hospital
- City Gardens
- Carlton on the Avon - Christchurch
- St Georges Hospital - Christchurch



## International Leak Detection

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