

Membrane Monitoring System

smartex® mx-va

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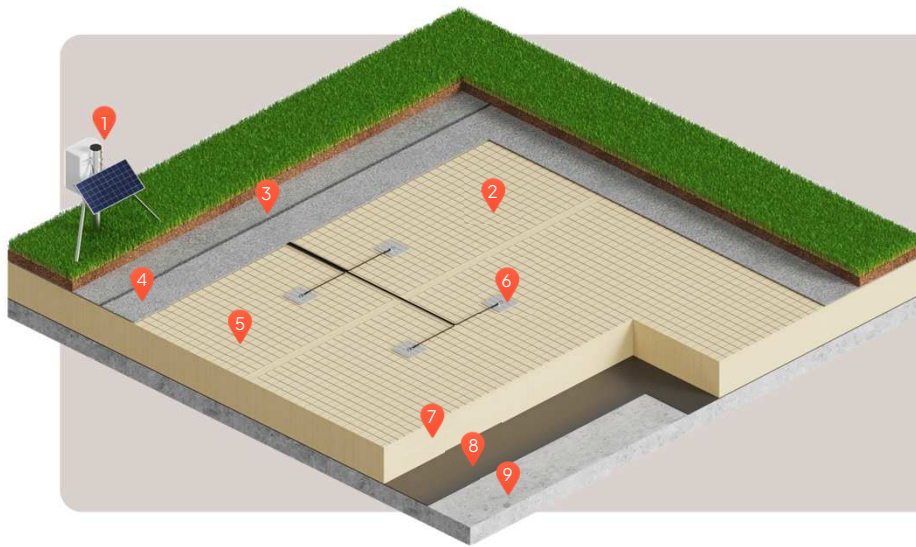
smartex® mx-va

Ideal for flat roofs, green roofs and solar roofs using peel-and-roll base sheets

Summary

smartex® mx-va is an innovative monitoring system for monitoring waterproofing membranes. The system consists of a stainless steel measuring grid below the waterproofing membrane and a counter electrode above. In this way, the waterproofing is monitored segment by segment and in real time.

In the event of a leak, the system immediately reports the damage to the building operator – even before water can spread through the roof structure. The measuring segments also enable segment-by-segment localization of the affected area, thus allowing targeted, fast and cost-efficient repairs.



1. ProGeo® measuring unit (Solar variant)
2. Segment-by-segment location of the leak
3. Counter electrode
4. Membrane
5. Stainless steel contact layer
6. smartex® mx Connection Set
7. Thermal insulation
8. Vapor barrier
9. Building construction

Features



Leak localization

smartex® mx-va ensures reliable safety by monitoring clearly defined segments and detecting leaks at segment level. This enables targeted repairs and saves costs.



Full surface monitoring

The smartex® mx systems measure the integrity of the waterproofing by means of the sensors and the grid over the entire surface. The full-surface functionality is a considerable added value compared to conventional humidity sensors.



Real-time capable

Due to the tightly timed measurement intervals and the direct connection to the measuring unit, the data is transmitted to the monitoring portal in real time.



Direct monitoring of the waterproofing

The smartex® mx measurement method does not measure the moisture in the roof structure, but the integrity of the waterproofing.



Immediate leakage detection

Direct monitoring of the seal guarantees immediate detection of leaks. The process therefore allows leaks to be detected before the water spreads through the structure and causes damage.



Physical proof of tightness

Compared to conventional moisture sensors, a full-surface physical test of the seal is carried out in wet conditions without manual testing

System Description

smartex® mx-vä is a microcontroller-controlled monitoring system for real-time monitoring of seals. With smartex® mx-vä, the sealing is monitored segment by segment. Leaks that occur are immediately detected and localized by segment.

The system consists of a conductive stainless steel measuring grid, counter electrodes on the seal, connection sets with connection cables and, in some cases, collector lines. In the course of installation, the grid is segmented into measuring sections to be divided according to customer specifications. Each segment is connected to the pre-assembled collector line via a ready-to-connect set with an integrated connection cable and evaluated by a connected measuring unit in conjunction with our internet-based database server.

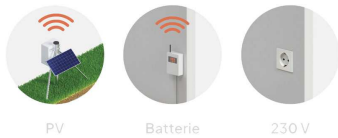
If there is a leak in the seal, a compensating current flows from the counter electrodes on the seal over the wet surface of the seal and the leakage to the contact position below the seal, leading to a measurable change in the electrical potential distribution. Based on these changes, the leakage event is detected and the leakage segment is calculated.

The monitoring system works with a connection to our internet-based monitoring portal. The data measured on site is automatically stored and evaluated there on a project-by-project basis. Furthermore, the user has access to a convenient user interface via any Internet-enabled PC. This includes automatic alerting in the event of an alarm with indication of the calculated leakage position, as well as in the event of faults by e-mail and/or SMS to any recipient that can be specified, alarm management, the display of detected leakage events in tabular form and as a pinpoint representation in the supervisory plan, the evaluation of the data as time series and location-based distributions, user and rights management and many other useful features. The connection to an existing building management system on site is possible.

With smartex® mx-vä, the level of information about the moisture protection of the building is significantly improved. The early detection and automatic location of leaks can avoid expensive substance losses and make an important contribution to achieving sustainability goals. With smartex® mx-vä, builders can be sure that their building is efficiently protected and that potential damage is detected in good time.

Data transmission and power supply

Power supply of the measuring unit



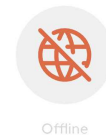
The power supply is via a 230V / 120V connection, battery or PV with a backup battery.

Internet connection of the measuring unit



The measuring unit is supplied with Internet via WLAN, LAN or mobile communications.

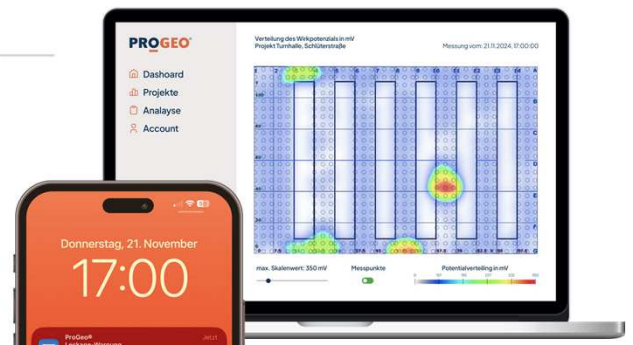
Offline systems



In exceptional cases, the ProGeo® systems can also be delivered in an offline mode.

Web-based monitoring portal

-  **Alarm status**
Check active alarms and control the condition of your roof reliably and precisely.
-  **Data analysis and visualization**
Analyze moisture development over time series and precisely identify critical moisture penetration with clear heat maps.
-  **Documentation**
Document all processes around the monitored object.



Suitable areas of application

Roof structures

- As an alternative to the smartex® mx-PEEL system for self adhesive / peel-and-roll waterproofing membranes
- Only in the case of electrically non-conductive materials of waterproofing
- Only in the case of thermal insulation with a non-metallic surface

Alternatives for other roof structures

- *The smartex® mx-PEEL system is used for loosely laid, mechanically fastened waterproofing systems as well as full-surface bonded waterproofing systems with hot bitumen.*
- *For a metallic surface of thermal insulation, the smartex® mx-al system is used*

Dachnutzung

- Flat roofs
- Green roofs
- Solar roofs
- Retention roofs
- Intensively used roof area, e.g. for data centers

Other areas of application

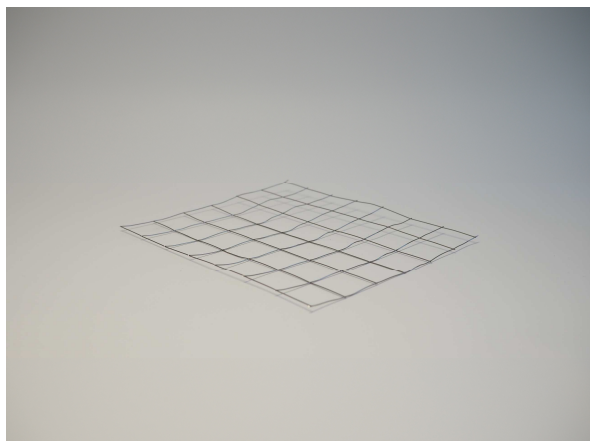
- Floor plates
- Bridges

References – A selection of over 4000 projects

Objekt	BESCHREIBUNG	FLÄCHE	JAHR
Jahnschule Bad Tölz	Expansion of the school building and roof monitoring	400 m²	2024
Yunesit'in Häuser (CAN)	Monitoring of the foundation slab for wooden houses	100 m²	2024
Feuerwehrwache München	New construction of Fire Station 5 with full-surface roof monitoring	2.000 m²	2024
Immeuble Victoire (FRA)	Renovation of an exclusive office and hotel building in Paris	580 m²	2024
Stadtwerke Saarbrücken	4 roof surfaces of an administrative building	600 m²	2024
Realschule Aichach	Complete renovation and roof monitoring with smartex® mx-va	900 m²	2024

System Component

Stainless Steel Measuring Grid



The smartex® stainless steel measuring grid serves as a contact layer for the smartex® – mx-va leak detection and monitoring system. To electrically contact the individual strips with each other, the grid must be laid with an overlap of at least 5 cm. During processing, care must be taken to ensure sufficient thermal activation and a full-surface pressing of the underlay membrane in the course of welding on the surface membrane in order to ensure the necessary adhesive bond for thermal insulation.

Quality	Welded rectangle stainless steel mesh
Material	V2A, 1.4301
Execution	Mesh size approx. 50×50 mm
Wire diameter	0,6 mm
Tensile force calc. for single wire	141 to 212 N
Roll length	40 m
Roll width	1500 mm
Flammability	non-flammable

Connection set

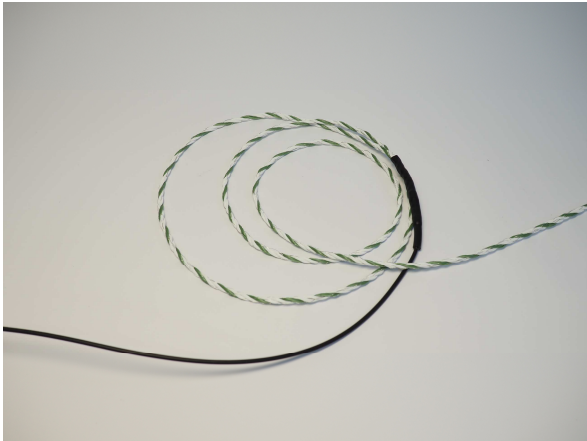


The smartex® connection set made of 1 mm galvanized sheet steel as a nail plate with 8 mm nail depth with pre-assembled LI2Y 1.5 mm² connection cables in the required length to the collector line or measuring unit in black PE insulation.

Dimensions	60×100 mm
Sheet thickness	1 mm
Nail depth	8 mm
Material	Galvanized steel sheet
Supply cable	LI2Y 1,5 mm ²
Max. length of supply cable	50 m
Fastening	Adhesive tape

System Component

Counter electrode



The smartex® counter electrodes are used to imprint the signal potential. At least one counter electrode is required per roof surface. In the case of larger contiguous roof areas, one counter electrode per 500 m² must be provided.

Number of stainless steel conductors	6 (stranded stainless steel-plastic wire)
Breaking load	350 kg
Diameter	6 mm
Resistance	3,87 Ω/m
Conductor	0,20 mm
Supply line	Litze 1,5 mm²
Mantelmaterial Zuleitung	Polyethylen (PE)
Max. Länge Zuleitung	500 m

Measuring Unit



The smartex® - microBOX plus is a measurement unit designed for the automatic, program-controlled execution of measurements for smartex® monitoring systems. The data can be transferred to the ProGeo Monitoring Portal for analysis or—depending on the specific system type—can also be analyzed locally. The device is housed in an IP65-rated plastic enclosure. WLAN, LAN, or LTE data modules are available as interfaces. The 8 built-in measurement inputs can be expanded in modules of 16 measurement inputs each.

The following technical specifications apply:

Operating Voltage	5V DC
Max. Current consumption	1A
Electrode outputs	1
Output Voltage	12V
Electrode Inputs	8 (+n x 16)
Input Voltage Range	0 - 10V DC
Input Impedance	100k Ohm
Interfaces	Wifi, LAN, LTE
Dimensions	250 x 180 x 110 mm

