



Finland's Largest Indoor Arena Suffered from Costly and Hard-to-Repair Roof Leaks



Finland's largest indoor arena, Botniahall, had long struggled with roof leaks that were difficult-to-detect and repair. During the ongoing roof renovation, smart VILPE Sense products are being installed. VILPE Sense leak detectors alert for excessive moisture, making it easier to pinpoint leaks on the large roof. Additionally, a VILPE Sense moisture management system is being installed to ventilate the roof as needed, keeping the insulation layer dry. Vaasanseudun Areenat, the consortium managing the Botniahall, expects to save significant amounts on roof maintenance and major repairs.

Moisture Damage on the Botniahall Roof is Combated with Smart VILPE Sense Products



The Botniahall in Korsholm near Vaasa, Finland, was constructed in 1997. Covering over 172,000 square feet and standing 67 feet tall, the hall is bustling daily with various activities. It serves as a venue for practising various sports, hosting matches and competitions, and organising events like fairs and celebrations. The hall is owned by the Municipality of Korsholm and the City of Vaasa and is managed by Vaasanseudun Areenat.

Roof Leaks Resulted in Six-Figure Costs

The renovation of the thirty-year-old Botniahall has commenced, and a roof remodel was unavoidable as the old PVC roofing had reached its end, with numerous leaks present. The large roof, 183,000 sq ft in total, initially had several challenging leaks, wet insulation in various spots, and water had penetrated the roof and entered the hall. The worn-out surface material and improperly attached water guides from the construction phase compounded the leakage issue. Michael Lyyski, the manager of Vaasanseudun Areenat, notes that the roof has long been plagued by leaks, resulting in substantial repair costs.

"We're talking about a six-figure cost. Also, the partially wet insulation has likely lost its insulating properties and increased the energy consumption of the hall," says Lyyski.

The curved shape of the roof complicated repairs, as access requires a crane, and the steepness made walking on the roof impossible. Additionally, locating leaks on such a large roof has been extremely difficult. Jyrki Tyynelä, regional manager of TEP Roof Oy, who has frequently repaired the roof, commented on the severity of the leaks.

"It's rare to see this many leaks. In repair situations, we have been able to find and fix only the worst and clearly visible leaks. Repairing a leak usually required at least a day's work," says Tyynelä.

Savings from Leak Detection and Demand-Based Ventilation

When the CEO of VILPE Oy Tuomas Saikkonen, a manufacturer of roofing and ventilation products located near the Botniahall, learned of the leak problems and upcoming renovation, he reached out to Lyyski and introduced the new VILPE Sense product line. VILPE Sense is a solution developed for moisture management in structures, consisting of devices that alert to excessive moisture, aid in locating leaks, and ventilate structures as needed to keep the insulation layer dry.

Given the challenges of detecting leaks on the large roof, it was decided to install the VILPE Sense leak detection system. The system continuously monitors roof moisture levels, alerts to excessive moisture, and pinpoints leaks, accelerating repairs. Lyyski was immediately enthusiastic about the VILPE Sense leak detectors.

"We're realistic in that sense that even with a new and fantastic roof, leaks will occur over the years. It's clear to us that investing in smart products will bring us savings in roof maintenance. A well-maintained roof extends its lifespan," says Lyyski.

Alongside the leak detection system, an investment was also made in the VILPE Sense moisture control system, which analyses data from structures, detects elevated moisture levels, and ventilates the structures as needed to dry the insulation

PROJECT DETAILS

Constructed in 1997 for sports and events

Size: Hall 172,000 sq ft, height 67 feet, roof 183,000 sq ft

Roofing and shape: PVC roofing, curved shape

Roofing company: TEP Roof Oy, led by regional manager Jyrki Tyynelä

Renovation design by Esa Viitanen, ArkMILL

VILPE products: 3 VILPE Sense mobile base stations, 487 VILPE Sense leak detectors, 14 ECo Sense roof fans, 14 VILPE Sense base kits

layer. Maintaining a dry insulation layer is vital for ensuring long-term durability and performance of structures.

Easy Installation

Jyrki Tyynelä from TEP Roof Oy is responsible for the roof renovation of the Botniahall. Chief architect Esa Viitanen of ArkMILL has planned the renovation. The total budget for the renovation is set at \$2.7 million USD. The renovation includes replacing wet thermal insulation, repairing vapour barrier joints, renewing eaves and PVC roofing, and installing VILPE Sense products. As of this writing, the roof renovation is still in progress.

About three-quarters of the VILPE products have been installed on the roof of the Botniahall. The roof will feature 487 VILPE Sense leak detectors, installed approximately 16 feet apart, and 14 roof fans for demand-based ventilation of the insulation layer. This means that ventilation is enhanced when excessive moisture is detected in the insulation layer. Conversely, ventilation is reduced when the insulation layer is dry, or if the outdoor air is moist or below freezing.

A so-called moisture map was drawn up for the roof during the design phase, on which the suitable installation points for the leak detectors were planned.

"Since the design phase was carried out carefully, the installation is proceeding smoothly. The products are installed according to the moisture map, and it's important to be precise to ensure that the products are placed in the correct locations," says Tyynelä.

"The Most Effective Solution on the Market"

As a roofing professional, Tyynelä has been keenly observing the launch of new smart products on the market.

"According to my opinion, the VILPE Sense products are the most effective solution on the market for detecting leaks and providing demand-based ventilation. The leak repairs on the Botniahall roof will undoubtedly become easier. Before, we searched for leaks across thousands of square feet of roofing, but with the new system, locating them will be hundred times easier," says Tyynelä.

Tyynelä particularly recommends VILPE Sense for roofs that are difficult to access.

"Searching for leaks under solar panels is also challenging, as leaks are difficult to detect. Patchwork repairs can be costly," notes Tyynelä.

