IMMEDIATE PEACE OF MIND

SOLUTIONS FOR EXTREME ICE & CONDENSATION BUILD UP AT A DISTRIBUTION COMPLEX IN MASSACHUSETTS

A VAPOR ARMOUR CASE STUDY

The Problems

After meeting with the leaders of this Massachusetts facility, Vapor Armour learned of the following concerns:

PROBLEM #1
Severe icing and condensation in a distribution freezer and cooler

PROBLEM #2
An inability of the refrigeration system to maintain adequate temperature inside the freezer and cooler

The Solutions

SOLUTION: STEP #1
Install Vapor Armour™ Exterior Compression Seal Upgrade to Freezer (approx. 1,191 lineal feet Retro installation)

SOLUTION: STEP #2
Install Vapor Armour™ Exterior Compression Seal Upgrade to 2015 Cooler (approx. 598 lineal feet Retro installation)

SOLUTION: STEP #3
Install Vapor Armour™ Exterior Compression Seal Upgrade to Penthouse Roof Deck Base Perimeter (approx. 600 lineal feet Retro installation).

PHYSICAL PLANT SPECS

A 478,800 sq. ft. multi temperature distribution center:

- -10° Freezer = 90,425 sq. ft.
- 35° Cooler – 70,500 sq. ft.
- 8 Penthouses = 2000 sq. ft.

INDUSTRY-LEADING APPROACH

Vapor Armour performed a free, invasive Forensic Evaluation of the facility, and took Thermal Images and Core Samples to determine the extent of the issues.

Forensic Evaluation

It is more important than ever for us to maintain a food-safe facility and maintain our budgets to comply with the USDA, FDA, and Insurance Audits — and all of that is possible with Vapor Armour's Free Virtual Forensic Evaluation. For this Florida facility, here's what we did:

STEP 1: VISUAL INSPECTION

A. Customer was correct: our VISUAL inspection indicated major icing inside the freezers, serious condensation in the coolers and the Penthouses were severely icing.
B. Visual inspection of the freezer and cooler area indicated massive air infiltration from outside the facilities through a failed perimeter seal between the roof to IMP connection.
C. Penthouses were of 2 conditions: either they were icing, or they were condensing.
D. Condensation was dripping inside the cooler and was putting product at risk of contamination.

STEP 2: THERMAL IMAGING

A. Warm air was entering into the facility from 2 locations: the roof connection to the Penthouse and the Exterior perimeter.
B. The dripping inside the cooler portion was also being caused by a stream of warm air hitting the cooler surfaces and drip ping on product - risking product contamination.
C. The thermal imaging showed temperatures as warm as 35° entering the freezer and 61° entering the cooler at the perimeter.
D. The entire perimeter of both the freezer and cooler showed an extremely hot signature approximately 40' to 60' from the exterior edge of the building. This indicated a sizable portion of the roofing insulation had been compromised from air infiltration.

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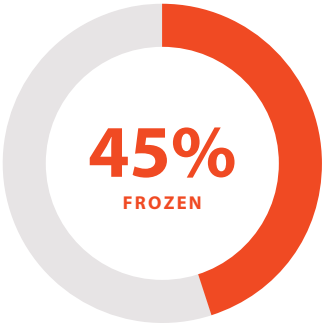
STEP 3: CORE SAMPLING

From the thermal imaging, we needed to confirm the roof deck status below the surface by drilling cores through the roof membrane to the roof deck and viewing the samples. We drilled 15-18 such core samples which showed the following:

- 40 feet' into the field from the freezer perimeter, we found dense frozen insulation and completely saturated insulation 80' around the perimeter. The entire loading dock area had no viable insulation remaining.
- Vapor Armour's forensic evaluation determined the loss of R-value of the insulation was the cause of the temperature issues the facility was experiencing.
- The Cooler Penthouses perimeter was water saturated as much as 20' from the Penthouse base.
- The Freezer Penthouses perimeter was frozen as much as 10' from the Penthouse base.

Key Findings & Extent of the Concern

From the Forensic Evaluation, it was determined:



CONCERN #1

Of the 90,425 sq. ft freezer, 41,000 sq. ft had frozen insulation

CONCERN #2

54,990 of the 70,500 sq. ft insulation inside the 35° Cooler was contaminated.

CONCERN #3

Vapor Armour's forensic evaluation determined the **FAILED PERIMETER VAPOR BARRIER** caused a **HIGH LOSS OF INSULATION R-VALUE** which in turn **CAUSED THE TEMPERATURE ISSUES** the facility was experiencing.

Project Results

We can discuss the results from this project in at least 5 variants: Specific Concerns recalculated to actual, Future Results, Energy Savings, ROI, and FSMA regulatory compliance.

ENERGY SAVINGS

The reduction in energy usage attributable to Vapor Armour vaporbarrier installation was over 39%. This represents a yearly savings of at least $459,000 per annum.

FUTURE RESULTS

We provided a Building Envelope 20-year Systems Warranty, ensuring the building envelope will be free from leaks, contaminated insulation, ice and condensation for 20 years.

54% ROI

PAYBACK IN JUST 22 MONTHS

RETURN ON INVESTMENT

Based on a simple pay back analysis (ROC), the cost of the project divided by the energy savings alone gives a payback of 22 months.

FSMA & OTHER REGULATORY COMPLIANCE

With this VA building envelope replacement and 20-year warranty, Ice or Condensation caused by vapor leaks or vapor barrier discontinuity is eradicated and the building is FSMA Compliant.

In Summary (Immediate Peace of Mind)

As documented, this contamination, the ice and condensation were easily visible to the naked eye. The contaminated – wet and frozen – insulation was obvious. The roof membrane was beyond its usefulness and replaced after the Vapor Armour was installed.

The project of replacing the building envelope while the operation continued immediately affected a return. Eradicating the condensation and ice insures there will be no FSMA violations from Vapor Drive. Because of the ROI, this project will pay for itself in a little less than 2 years just from the energy savings and those savings will continue beyond the first 2 years. Finally, there should be peace of mind knowing this building envelope will continue its efficiency for at least 20 years.