

Sure-Seal® EPDM
Cool Gray EPDM

CASE STUDY

Sure-Seal EPDM Protects Northwest Wisconsin Facility from Harsh Winter Weather



JOB PROFILE

PROJECT LOCATIONS:

Rice Lake, Wisconsin

CARLISLE APPLICATOR:

Paul's Sheet Metal, Inc.

BUILDING OWNER:

Quanex, Inc.

ROOFING SYSTEM:

- » 10'-wide, 60-mil Sure-Seal EPDM Cool Gray membrane
- » SecurShield® HD Polyiso Insulation
- » CAV-GRIP® III Low-VOC Adhesive/Primer

Quanex (NYSE: NX), is a publicly traded global manufacturing company serving OEMs in the fenestration, cabinetry, solar, refrigeration, and outdoor products markets. The company operates 34 plants across the United States and around the world, producing a diverse product line including insulating glass spacers, vinyl profiles, window and door screens, cabinet components, fenestration components, vinyl extrusions, rubber extrusions, kitchen components, bathroom components, and millwork.

The project plant is based in Rice Lake, Wisconsin, a small community in northwest Wisconsin, where winter chills come early and snowfall can exceed 50 inches.

The roof on the plant has been updated over the years in sections. Recently, one of the roof's five sections had experienced extreme hail damage and needed to be replaced. One section, 71,800 square feet of 15-year old PVC membrane that had been severely damaged by 2" diameter hail, was located on one end of the facility, adjacent to the company offices. Another 60,000 square foot section of a 31-year old adhered EPDM in the center of the facility was also replaced as it was well beyond the initial warranty term. The vast majority of the 325,00 square-foot roof was ballasted EPDM that withstood the severe hail storm extremely well.



Paul's Sheet Metal, Inc., also of Rice Lake, is a long-time roofing vendor for Quanex and was hired to replace the two sections of roofing. Paul's Sheet Metal (Paul's) has installed over 12 million square feet of Carlisle SynTec Systems' roofing products, has won multiple Carlisle Perfection Awards, has sat on Carlisle's Perfection Council, is a recipient of Carlisle's ESP (Excellence in Single-Ply) Award, and has been inducted into the Carlisle Hall of Fame.

For the center section of the roof, Paul's used Carlisle's new Sure-Seal EPDM Cool Gray membrane, a 60-mil (1.52 mm) non-reinforced sheet which offers a variety of features including reflectivity while still providing a 'dry-down' effect, a full 60 mils of weathering material with no internal scrim, superior elongation and weathering resistance that results in excellent hail damage resistance, and a dimensionally stable membrane that stays flexible in the extreme temperatures that often impact Rice Lake, Wisconsin.

"This was our first experience with the gray EPDM membrane," said Greg Hayes, roofing manager for Paul's, "and we really like it. Not only is it easy to work with, but during the hot summer months when black EPDM can reach 180 degrees or more, the Cool Gray membrane stayed nice and cool. So we didn't need gloves or knee pads for protection, which made it easy for our crew to work with."



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Paul’s crew included five to seven applicators. The team installed a Carlisle SecurShield HD Polyiso Insulation cover board, which provides an additional R-value of 2.5 – higher than most cover boards – and is made with Carlisle’s exclusive ReadyFlash® Technology, which enables contractors to manipulate adhesive flash-off times. Most importantly, the HFC- and HCFC-free cover board provides exceptional protection against rooftop traffic, mold, and moisture, and achieves a Factory Mutual severe hail rating which is important in this geography.

The cover board was mechanically attached with standard Carlisle fasteners and plates, eight per board, which sounds very easy and straightforward. But it was not.

“The underside of the steel deck was highly congested with electrical conduit, wires, and fiberoptic cables,” said Hayes. “To make sure we didn’t hit any of those wires and cables, we had to have a spotter in the building underneath the area where we were working at all times, with a two-way radio helping to direct the team on the roof. And since this was directly over the manufacturing area, where safety was a big concern, we had to have a company escort with our guy the entire time. It was actually a very big deal, and our team handled it like the pros they are.”

They never hit a cable or wire under the deck while securing the cover board.

Once the cover board was installed, Paul’s crew installed the Cool Gray EPDM. To make the process easier and faster, the material was ordered with Carlisle’s patented Factory-Applied Tape™ technology which provides a better seam and maximizes the splice area.

“Besides being a much cooler material for the crew to handle,” said Hayes, “the gray membrane provides a good balance between providing some reflectivity during the summer months, while also offering some heat gains in the winter.”

The team from Paul’s Sheet Metal fully adhered the membrane to the cover board with Carlisle’s CAV-GRIP III Adhesive, a one-part, low-VOC, spray-applied contact adhesive. The adhesive provides



a very fast flash-off time and considerable labor savings when compared to traditional bonding adhesive. Paul’s chose to use the smaller #40 cylinders for easy portability on the roof.

“Since it’s a one-part adhesive applied with a stand-up spray gun, our guys could carry the canisters while applying the adhesive to both the cover board and to the back of the membrane, which was then rolled in and broomed down,” said Hayes.

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The manufacturing area of the Quanex plant is not air-conditioned, and due to the autoclaves and other equipment, the facility creates quite a lot of heat. For that reason, there are several large exhaust fans located across the roof on curbs. For this detail, the membrane was adhered from the deck up the curb and secured with fasteners and plates. A second piece of cured membrane was then adhered to the curb and finished with a counterflashing detail.

The next challenge for Paul's team was to tie both sides of the new roof section into the existing roofing systems on either side. On one side, there was a short knee wall covered with shop-bent coping that separated the new roof from a section of ballasted EPDM. For this detail, they removed the coping and ran the membrane up and over the knee wall using the adhesive, covered all T-joints with a piece of uncured flashing membrane, and then replaced the coping. The facility also had a short knee wall around the entire outer edge, so Paul's team used the same detail to terminate the roof on the outer edges of the facility.

On the other side of the new roof section there was a drainage channel running the entire width of the building which housed several internal drains. Paul's crew terminated the new membrane at the edge of the drainage channel with fasteners and plates and stripped-in with a cover sheet over the top. In addition, several OEM drains in the field of the roof were removed and

cleaned. Large sections of new membrane were installed over the sump, and the drains were replaced over the top.

"Each section of the roof had to be carefully tied into the adjacent one," said Hayes. "Our team did a great job marrying the various systems on the roof, all without any issues."

For the larger white PVC section of the roof, which was replaced with 60-mil Carlisle Sure-Seal EPDM, Paul's team followed the same installation procedures and used the same assembly. They had someone in the plant to make sure the installation team did not penetrate any of the cable or wires on the underside of the deck, and they installed the membrane using the same assembly and process used for the Cool Gray EPDM.

"The hail really did quite a lot of damage to the PVC membrane," said Hayes. "But now the entire roof is protected by EPDM. Some of it is ballasted and some of it is not, but we think EPDM is far and away the best possible material for northwest Wisconsin and the harsh winter weather here, because it allows for thermal expansion and it performs well during the winter to help us get that snow load off the roof quickly."

In the end, Quanex has two great new sections of roof protecting its facility for many years to come, along with two great partners in Paul's Sheet Metal and Carlisle SynTec Systems.