CARLISLE SYNTEC SYSTEMS

Sure-Seal® EPDM Roofing Systems

CASE STUDY

Turning 900,000+ SF of Roofing Waste into Sustainable Value

JOB PROFILE

PROJECT LOCATION:
Pittson, PA

CARLISLE APPLICATOR:
Mile Square Roofing, Stanhope, NJ

RECYCLING CONTRACTOR:
Nationwide Foam Recycling, Framingham, MA

BUILDING OWNER:
National Retailer

ROOFING SYSTEM:
- 30'-wide, 60-mil Sure-Seal EPDM membrane with Factory-Applied Tape™
- CAV-GRIP® III Low-VOC Aerosol Contact Adhesive

RECYCLING REBATE:
≈ $40,000

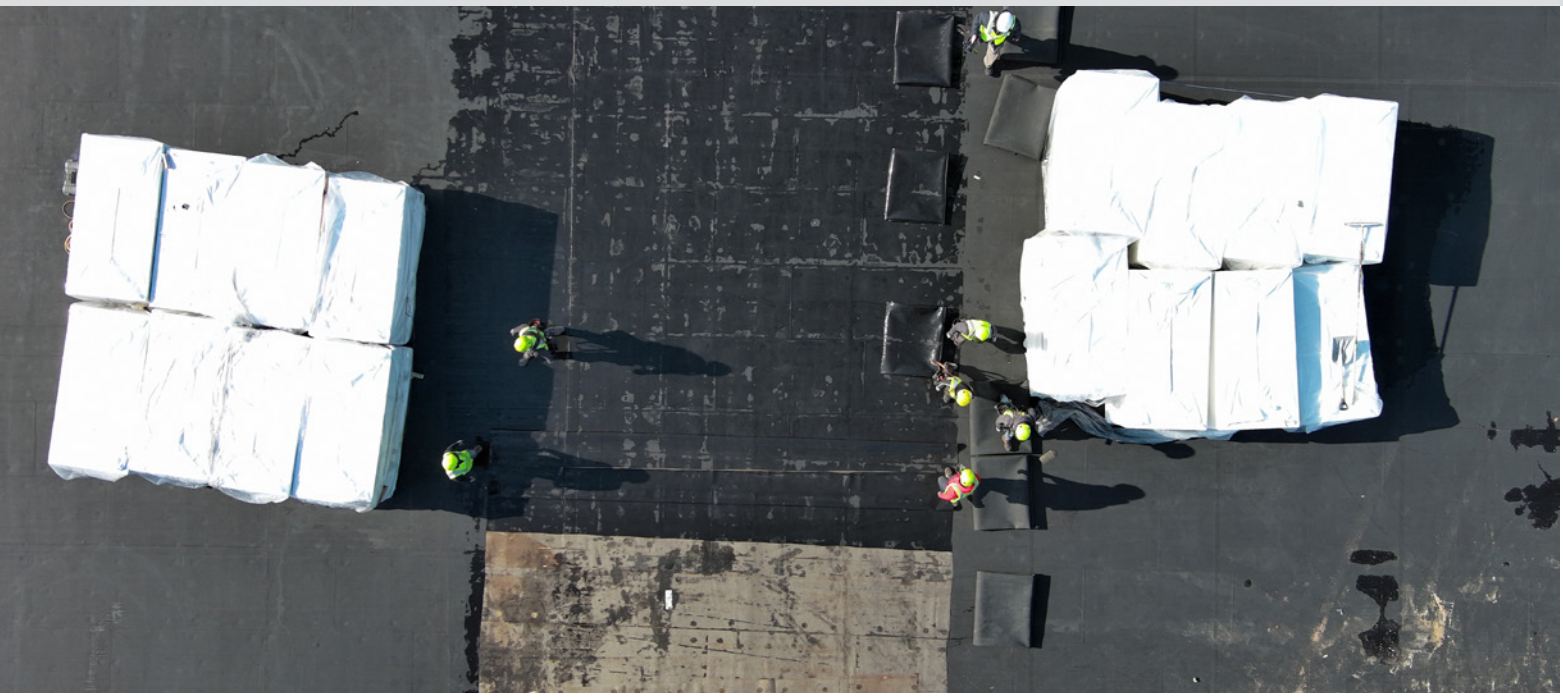
Commercial roofing is not considered to be a glamorous business. However, when the roofing contractor, the building owner, and the roof consultant are all on the same page, focused on sustainability and environmental issues, and consistently sharing updates with open and honest communications to ensure that the project goes smoothly, commercial roofing can be a beautiful thing.

That's exactly what happened when it came time to put a new roof on the Pittston, PA, warehouse and distribution center for one of the country's largest clothing retailers with more than 1,000 stores in the U.S.

The company owns and operates several distribution centers around the country and has invested wisely in their roofing assets with a keen focus on sustainability and maximum long-term performance.

For more than a decade, Carlisle has partnered with Nationwide Foam Recycling (NFR) of Framingham, MA, to offer a rooftop recycling program to Carlisle Authorized Applicators. The program is designed to help reduce the environmental impact of roof tear-offs and minimize the amount of waste going into local landfills.

ROOFING WASTE INTO SUSTAINABLE VALUE



So, when it was time to put a new 1.2 million-square-foot roof on its warehouse and distribution center in Pittston, MA, the company, working with roof consultant Bill O'Neil of Building Envelope Management from Hull, MA, turned to Carlisle and its rooftop recycling and rebate program.

For the project, Mile Square Roofing of Stanhope, NJ, was awarded the job. Mile Square is a family-owned business established in 1984 that specializes in commercial, industrial, and institutional roofing in the tri-state area. The NRCA member company is a long-time Carlisle Authorized Applicator and has been recognized by Carlisle with a prestigious Excellence in Single-Ply (ESP) Award.

The Big Picture

According to the Environmental Protection Agency (EPA), construction and demolition (C&D) waste from buildings in the U.S. totals an estimated 332 billion pounds annually. Of that, roofing waste accounts for about 6.5 million tons of waste going into landfills each year.

"Adhered membrane systems can present challenges for recycling, but after performing a few test pulls, we confirmed that the existing membrane could be removed from the insulation with minimal issues, making it a suitable option for this project, and for taking advantage of our roof recycling and rebate incentive program," said Chris Kann, Product Manager for Specialty Products and Sustainability at Carlisle Construction Materials, LLC. "It was a large, wide-open roof, with a relatively good-condition adhered EPDM system, on a building owned by a company that is committed to sustainable best practices – making it an ideal candidate for recycling."

The existing EPDM roof had reached the end of its service life and could no longer effectively protect the retailer's valuable inventory. However, since this was an operating warehouse, the roof had to be removed and replaced in sections to keep the building dry throughout the process.

The first step was removing the old roof down to the insulation. For this work, the Mile Square Roofing team cut the old roofing membrane into 20 x 30-foot sections and then peeled it from the insulation at roughly a 180-degree angle. This enabled the team to remove the membrane without pulling up any of the insulation, which was important for the recycling effort.

Tim Wyka, owner of Mile Square Roofing, commented, "I thought our team did an outstanding job at removing and palletizing the old membrane."

Once removed from the roof, the team neatly folded the 600-square-foot pieces of EPDM and stacked them onto 48-inch square pallets. Each pallet was stacked three feet high, and the membrane was strapped down to hold it securely for transit.

"There was definitely a learning curve for our crew," said Wyka. "This was our first project recycling EPDM, but pretty quickly we figured out the most efficient way to cut, remove, and fold the membrane so the process got easier as the job progressed."

The Assembly

The roof was divided into two sections, an upper and a lower roof. The lower roof was approximately 750,000 square feet or two-thirds of the roof, and the upper section accounted for the remainder of the 1.2 million square feet.

> "Carlisle's **Roof Recycling Program** represents the **future of roof disposal**."
>
> —Chris Kann

The assembly for both sections was essentially the same: add 2.6 inches of 25 PSI SecurShield® Polyiso Insulation with ReadyFlash® Technology and adhere the new 60-mil Carlisle Sure-Seal EPDM membrane with six-inch-wide Factory-Applied Tape to the substrate using Carlisle's CAV-GRIP III Low-VOC Adhesive. Since the building owner is insured by Factory Mutual Global, the assembly needed to be approved by Factory Mutual prior to installation. The approval involved both wind uplift and fire performance.

"The one difference in the assembly was that we also added a half-inch layer of gypsum fiber board to the lower roof section on either side of the fire wall," said Wyka.

The existing EPDM roof had been adhered to 2.6-inches of polyisocyanurate insulation that was mechanically fastened to the building's steel deck. To meet the required R-30 code, and the necessary FM Global 1A-90 Rating, Mile Square had to mechanically fasten a layer of 2.6-inch SecurShield Polyisocyanurate insulation over the top of the existing insulation. For this portion of the project, the team used Carlisle HP Fasteners and 3-inch Insulation Plates.

On the main lower section of the roof, the Mile Square team also mechanically fastened a layer of half-inch gypsum board on top of the insulation on either side of the fire wall using Carlisle HP Fasteners and Plates.

"It's a wide-open roof, and we were able to work really well with the personnel on-site to stage materials for the project," said Wyka, "both incoming and outgoing, and on and off the roof. When you need a million-plus square feet of membrane, insulation, cover board, and all the related products, that requires quite a lot of material handling both on-site and on the roof, and lots of coordination and close communications with the building owner," he said.

As the Mile Square crew moved across the roof, the pallets of the old EPDM membrane were staged on-site until they could be picked up by a 48-foot flatbed truck and moved. A full truckload is 24 pallets and with just 200,000 square feet of roofing left, Mile Square had recycled nearly 800,000 square feet or about 350,000 pounds of material from the jobsite.

"When you look at the economics of roof recycling, it just makes good sense," commented Wyka. "Typically, we'd put 200 to 250 squares of EPDM material in a 30-yard dumpster, which would weigh seven to eight tons. For a project this large, the dump fees would be in the $65,000 range, and we'd be putting all that material into a local landfill."

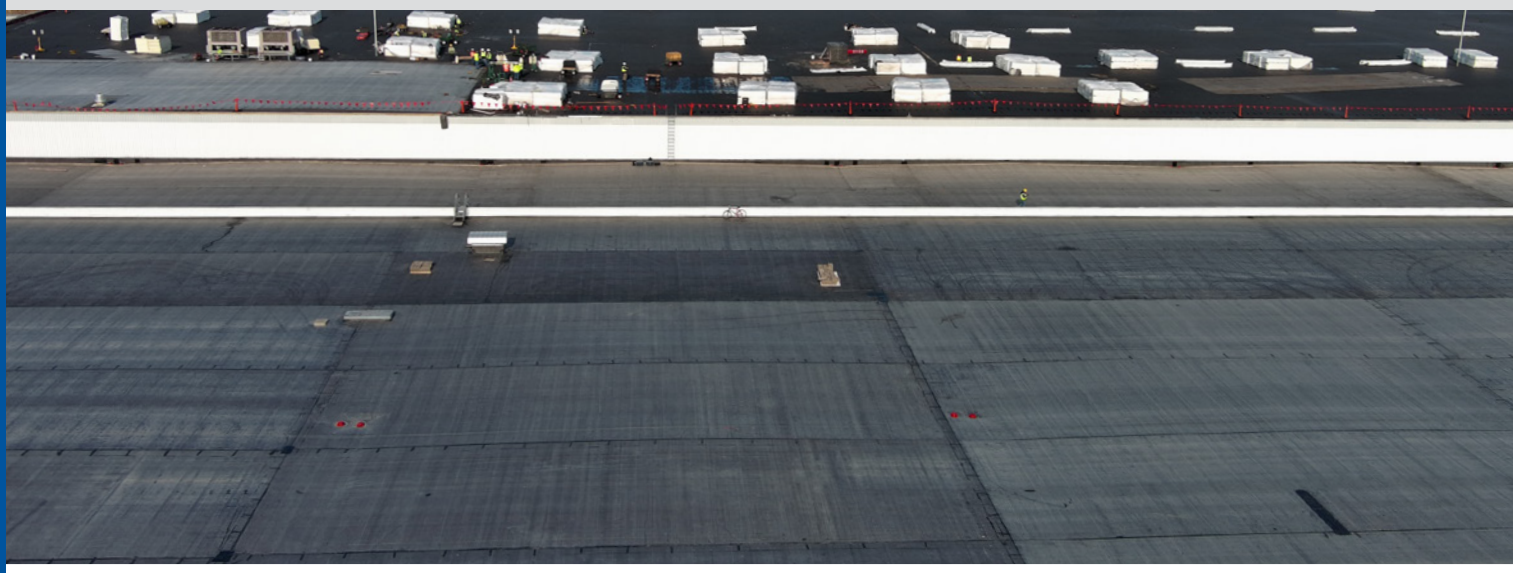
Roof Recycling

Nationwide Foam Recycling (NFR) reclaims all types of rigid foam insulation board and single-ply membrane from re-roofing jobsites throughout North America. According to company Vice President Richard Garrison, NFR provides jobsite collection services to roofing contractors, construction companies, roofing product manufacturers, and building owners to help them save money and reduce their environmental impacts. Since it was founded in 2007, the company has reclaimed over 40 million pounds of foam insulation and roofing membrane.

Once collected, materials are shipped to regional distribution hubs where they are checked for quality and prepared for sale or shipped directly to re-use customers.

"In our program, the collected materials are not ground up as feedstock for other new products," said Garrison. "Instead, our program focuses on re-using the materials 'as they are'. Roofing insulation and membrane have utility far beyond the lifecycle on a commercial flat roof. Common reuse applications for membrane include landscaping, weed control, roof patches, backyard pond liners, and tarps for general use." Rigid foam insulation is reused in walls, ceilings, attics, roofs, and below-grade building applications. These materials are put to use for another 15 to 20 years, or more.

CASE STUDY



ROOFING WASTE INTO SUSTAINABLE VALUE

Recycling Beyond the Membrane

Carlisle EPDM was specified for this project from the outset. Sure-Seal EPDM membrane has a long and strong history of long-term weathering performance in the market. From a sustainability perspective, EPDM offers a reduced carbon footprint and lower contributions to smog, acid rain, and global warming. Its superior long-term performance extends service life, reducing the frequency of re-roofing and lowering the overall environmental impact over the life of the building. So, for companies like this one that are concerned about the environment and sustainability, EPDM was the perfect solution.

Once the roof was stripped of the old membrane, and new insulation and cover boards were installed, Mile Square fully adhered the 30-foot-wide Sure-Seal EPDM membrane. For this, they used Carlisle CAV-GRIP III Low-VOC Aerosol Contact Adhesive, supplied in 85-pound, returnable and refillable cylinders. CAV-GRIP III is a low-VOC (<250 g/L), California-compliant, spray-applied adhesive and primer ideal for a wide variety of applications including securing Sure-Seal EPDM to approved substrates. The Mile Square team sprayed the adhesive onto the new insulation and EPDM, let it flash off, and then rolled the Sure-Seal membrane into the adhesive.

“We really like working with the CAV-GRIP III Adhesive,” said Wyka. “It goes down easily, flashes off very quickly, and enables us to get really good productivity. For this project we used the large, returnable CAV-GRIP III canisters, so we didn’t have to send them to the landfill once they were emptied, which was another savings for the building owner, and a benefit for the environment as well. In addition, the Factory-Applied Tape helps speed the installation significantly, so the team really likes that as well.”

The roofing work included several penetrations that the Mile Square team had to address, including several lightning rods and some air handing units, which all to be carefully flashed. In addition, the company replaced several sections of a wood blocker on top of a parapet wall on the perimeter of the building.

Big Savings

In the end, the environmental savings were significant. Well over 900,000 square feet of membrane were reclaimed for reuse instead of going to local landfills and all the 85-pound adhesive canisters were returned to be refilled and reused. Additionally, this project qualified for Carlisle’s Roof Recycling Rebate Incentive program, providing Mile Square roofing with a $ .04 per square foot rebate for the recycled membrane, totaling close to $40,000 for the project.

“Carlisle does a great job promoting its recycling program,” said Wyka. “This was our first recycling project and working with the retailer, Carlisle, and Building Envelope Management was really great. The communication was outstanding and helped to make a large project go very smoothly. I wish every project had this type of cooperation and open communication.”

“This is a program that we deeply believe in at Carlisle, and we promote the program heavily to our contractors,” said Kann. “Carlisle’s roof recycling program represents the future of roof disposal. Applicators like Mile Square, who are early adopters and actively utilize the program on their projects, can quickly improve efficiency while positioning themselves as sustainability leaders within the industry. As more building owners seek environmentally responsible solutions, roof recycling should be a top priority for roofing applicators; every material diverted from landfills extends the product’s total lifecycle, benefits the environment, and creates value while reducing costs along the way.”

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