

EPDM

Roof Recycling



■ EPDM membrane is recycled and ground into crumb rubber.

Advancing Beyond Potential

by George Evanko

In just a few short years, recycling EPDM roof membrane has transformed from a nascent concept full of potential into a cost-efficient, environmentally sound reality that is being embraced by roofing professionals on tear-off re-roof projects across the United States and portions of Canada.

Among the factors driving the success of recycling rooftop rubber is a greater emphasis on re-roofing resulting from the stagnant new commercial construction market, higher expectations for green building practices in all aspects of construction, and a proven infrastructure that simplifies the process and makes recycling economically viable for roofing contractors and building owners.

At the same time, a decline in available landfill space in some parts of the country and rising disposal costs have contrib-

uted to the need for alternative solutions. According to the U.S. Environmental Protection Agency (EPA), 40 percent of total landfill waste comes from construction and demolition debris — one quarter of which is generated by roofing materials. While landfill space is plentiful nationally, some areas, such as the heavily populated East Coast, are facing critical capacity issues and have seen disposal costs escalate.



To address these issues, the EPDM Roofing Association (ERA) launched a recycling initiative in 2006 to determine the possibilities of recycling used, in-place EPDM roof membranes. Working closely with roofing manufacturers Firestone Building Products and Carlisle SynTec Inc., several pilot projects were executed to help better understand the feasibility and logistical process involved. By the end of 2007, approximately 1 million square feet of EPDM had been successfully removed, transported and recycled.

Continuing into 2008 and 2009, the program expanded and proved more viable as contractors became increasingly receptive to the idea and many discovered recycling EPDM allowed them to achieve lower (or

■ Insulation board removed from a roof tear-off is stored in a trailer provided by Nationwide Foam and transported to a recycling center. (Photos courtesy of the EPDM Roofing Association.)



■ Sheets of EPDM membrane are folded and stacked on a flatbed truck from Nationwide Foam.

neutral) disposal costs while increasing environmental benefits. With the additional support of Nationwide Foam Inc. (NFI) and West Development Group (WDG) — the first two members of ERA's Recycling Council — the program made significant progress in 2009 in terms of national scope and cost efficiency.

Through these combined efforts, nearly 5 million square feet of post-consumer EPDM roof membrane has been recycled in the past three years, making it the leading recycled commercial roof membrane material in North America. In all, roughly 1.25 million pounds of reclaimed EPDM membrane have been diverted from landfills in the past three years.

Recycling in Action

While much has been learned about the technical aspects of recycling EPDM through the various research and pilot programs over the past few years, for such an effort to gain broad acceptance the process has to make sense financially as well as logistically. For roofing contractors accustomed to tearing off EPDM, tossing it in a dumpster and sending it to a local landfill, a shift of mindset is needed as well.

Today, that challenge is being met as a result of the partnership between ERA, NFI and WDG. NFI brings more than 20 years of recycling experience to the roofing industry and is North America's largest



■ Recycling baskets from WDG allow roofing contractors to quickly package EPDM membrane for transport.

EPDM and foam insulation board recycler. Through its nationwide network, NFI has created an easy-to-use EPDM roof recycling program that has been used in 48 states in this country and several provinces in southern Canada.

The program is available for low-slope ballasted and mechanically attached non-reinforced EPDM membrane tear-offs and offers jobsite collection and transportation directly to a recycling center. NFI also collects and recycles polyiso, EPS, XPS and composite board foam insulation and, in early 2009, began recycling concrete roof pavers.

"With the continued support of industry leaders and broader awareness among roofing professionals for the economical and environmental impact of EPDM recycling, we expect the rate of EPDM recycling to explode over the next two years," said Greg Conigliaro, president, Nationwide Foam Inc., Framingham, MA.

For roofing contractors, recycling EPDM and foam insulation rather than sending these materials to a landfill requires no special equipment or procedures. NFI can provide contractors with same-day cost estimates to determine the financial viability, while flexible scheduling to collect and haul away the EPDM membrane makes this logistically feasible. Cost estimates and scheduling information are available through NFI's online quoting system or by

phone.

"WDG works hand-in-hand with Nationwide to reclaim and recycle EPDM roofing membrane," explained WDG's Greg Butchko. "In the past 18 months, we have really seen this program take off and there is great growth potential because recycling EPDM benefits everyone involved in the process — both environmentally and economically."

WDG specializes in silicone and polyurethane foam technologies used in the roofing industry. The company is committed to sustainability and protecting the environment through ecologically sound products and practices. Its products are developed with knowledge gained from nearly 30 years of experience working with roofing contractors.

At WDG's facility in LaGrange, Ohio, 5-foot by 5-foot sheets of EPDM are sheared and ground into crumb rubber ranging in size from ¼ inch down to 100 microns (340 mesh) cryogenically ground EPDM. WDG grinds approximately 1,200 pounds of EPDM per hour using an environmentally friendly process that produces zero waste and retains all the physical properties of EPDM.

The company developed a formula for producing a UL-rated silicone roof coating as well as polyurethane roof and waterproofing coatings with 20 percent recycled EPDM, which serves to strengthen and

enhance the physical properties of the silicone topcoat and eliminates the need for petroleum-based solvents.

"During testing, we found that the physical properties we were trying to achieve were improved in some cases by using ground EPDM over other products," said Buschko. "This past year, we recycled about 1 million pounds of EPDM that was used for various products or stored for future use."

On-the-Job Successes

For Ron Howard of Sea Breeze Roofing in Houston and Justin Fetting of S.G.O. Roofing & Construction in Lakeville, Minn., choosing to recycle on recent tear-off projects proved to be sound decisions both environmentally and economically.

As he considered the 80,000 square feet of ballasted EPDM atop a layer of 3-inch-thick foam insulation that was scheduled to be torn off and re-roofed at the Rees Elementary School in Houston's Alief Independent School District, Howard decided to investigate recycling options with NFI.

"With the size of the roof, there would have been a lot of EPDM and insulation heading to the landfill," Howard said. "As it turned out, NFI was able to save us money by recycling the EPDM and insulation. And, we were happy to keep all that material out of the landfill."

To prepare the EPDM membrane for pickup, Sea Breeze crews removed all the ballast, swept the rooftop clean, and then

cut the EPDM panels into large sections, avoiding any fasteners and areas where bonding adhesive was used. Once cut, EPDM sections were folded into bundles, stacked on pallets and set aside until an NFI truck arrived on site to haul everything away.

"It was a smooth and straightforward process for us. Nationwide completed the job as quoted with no hidden charges," Howard explained. "In fact, even the ballast was hauled away to be cleaned and recycled, so everything that could be recycled on this job was recycled."

With its emphasis on public projects where environmental stewardship is increasingly important, Howard anticipates Sea Breeze Roofing will be weighing its recycling options more often.

On another school re-roofing project, the 45-mil ballasted EPDM roof on the Lake Marion Elementary School in Lakeville, Minn., was at least 15 years old and scheduled to be replaced with a 90-mil, fully adhered EPDM in late May 2009. As he analyzed the 77,000-square-foot re-roof project, Justin Fetting of S.G.O. Roofing & Construction contacted NFI about recycling the insulation. Unaware they also recycled EPDM, Fetting was pleased to learn that recycling both the EPDM membrane and insulation offered a 30 percent cost savings compared to traditional disposal, in addition to the environmental benefits.

"On a sizable project like this we felt that offering to recycle the old materials

was one more way for S.G.O.'s bid to stand out," Fetting said. "We felt good being able to support the environment. With the additional cost savings there was no reason not to do it."

For this project, S.G.O. removed the ballast, swept the EPDM membrane clean of debris, cut the membrane into manageable pieces, packaged them onto pallets and loaded them onto the flat-bed truck provided by NFI. NFI secured the materials and hauled them to the recycling center.

"This was our first experience recycling roofing materials. Overall, everything worked out very well," said Fetting. "It required some additional material management, while the flat-bed truck was in route, but we had access to an open parking lot to store the material. Once the truck arrived, we were able to load it quickly."

Following the recycling efforts, S.G.O. installed a new, fully adhered 90-mil EPDM membrane atop the school.

Fetting added that as the network of recyclers and transporters grows, the process will become even more convenient and accessible to a wider range of contractors. He estimates that recycling is a viable option for any project over 250,000 square feet.

When The Columbus Dispatch newspaper needed a new roof for its warehouse in Columbus, Ohio, Kevin George, director of engineering and maintenance, contacted WDG for what ultimately became an award-winning EPDM recycling project.

WDG removed the 42,000-square-foot



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EPDM membrane and cryogenically ground it into functional fillers used to enhance the physical properties of its roofing systems. With the existing more ballast used to create parking lots for youth athletic fields, 96 percent of the roofing system was recycled and diverted from the local landfill.

In recognition of these efforts, the Solid Waste Authority of Central Ohio presented the newspaper with a 2009 Emerald Award for Environmental Leadership. The prestigious annual award highlights the best green practices of Central Ohio businesses, nonprofits, schools, and individuals.

Beyond Cost Savings

Although cost savings alone can be a primary reason for choosing to recycle — particularly when EPDM and insulation board are both recycled — other factors such as qualifying for LEED credits and meeting roof specifications come into play as well.

With many cities now requiring new building construction and major renovations achieve specific LEED rating levels, it

is important to note that LEED points can be earned for waste diversion and recycling.

Increasingly, the decision to recycle is being made at the building owner/manager and specification level. For example, Consigliaro said the state of Wisconsin recently announced that all EPDM roofing membrane and insulation removed from state buildings must be recycled.

Similarly, the Denver Public Schools now specify that all materials removed during re-roofing projects be recycled. To date, NFI and the Denver schools have partnered on 11 projects and kept 20 tons of EPDM and insulation out of nearby landfills.

"In a short amount of time, EPDM recycling has transformed from a good idea into a robust program that is not only helping the environment but also proving to make financial sense," Consigliaro said. "We're finding that more than 80 percent of the time, recycling EPDM is a less expensive option than disposal. As such, contractors are able to make their bids more cost effective."

Butchko added, "About once a week, I get a call from an architect who is writing a recycling process into his specification. Some contractors are apprehensive initially, because it's a new way of operating. But between the cost benefits and the environmental impact most contractors we've worked with enjoy the opportunity to recycle."

Commercial roofing contractors are uniquely positioned to help convey the environmental benefits and economic value associated with roof recycling. With re-roofing driving business today and for the near term, there is no better time to make recycling a top priority.

For more information on EPDM recycling, visit www.epdmroofs.org. For more information about Nationwide Foam Inc., visit www.nationwidefoam.com. For more information about West Development Group, visit www.wsgsilicones.com.

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