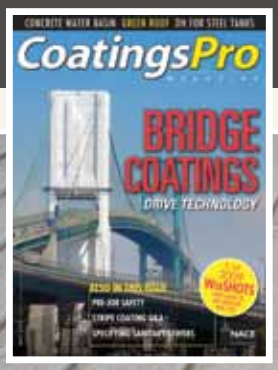
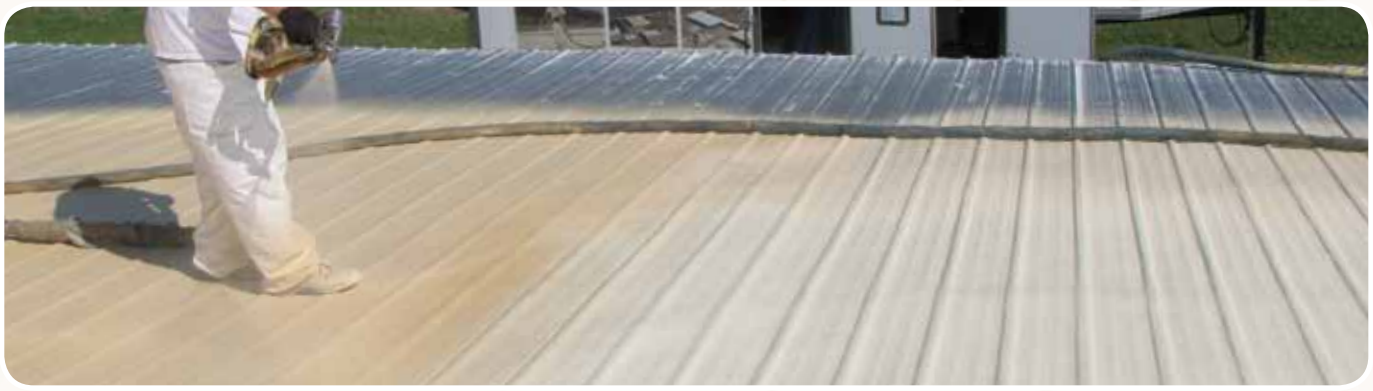


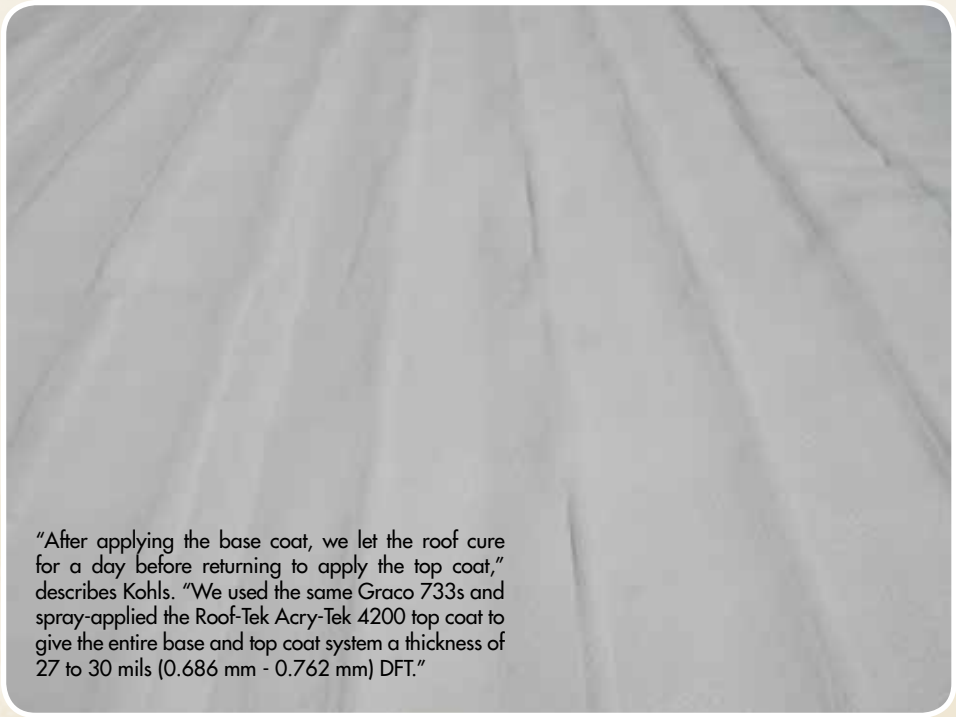
The roof was covered in the usual dirt and debris — including a green fungus. The Kohls crew pressure washed the surface using water and four Graco 40/30 3,500 psi (24,131.651 kPa) pressure washers. Then, after the roof had been given an initial cleaning, they followed with another solvent cleaning, using Hudson sprayers filled with Conklin's WAC II, a weathered acrylic roof cleaner.

Following the foam application, "The crew used Graco 733s to spray the Roof-Tek 4200 base coat on top of the BASF FE 348," says Kohls. Applied at 27 dry mils (0.686 mm), the Acryl-Tek 4200 system is a two-coat, single-component, 60% solids emulsion polymer based-on elastomeric, 100% aliphatic/acrylic resin designed to provide UV-protection and weatherability.

Going Green:

Roof Coatings Help Save Energy And Money





"After applying the base coat, we let the roof cure for a day before returning to apply the top coat," describes Kohls. "We used the same Graco 733s and spray-applied the Roof-Tek Acry-Tek 4200 top coat to give the entire base and top coat system a thickness of 27 to 30 mils (0.686 mm - 0.762 mm) DFT."

BY JENNIFER KRAMER

PHOTOS COURTESY OF KOHLS FOAM SYSTEMS, INC.

Today everyone is concerned with saving — saving the environment and saving money. And if you can do both at the same time, then you have achieved something special. This is the story of one of those times in which everything seems to come together — a skilled crew of applicators, cutting edge coatings technology, and a facility seeking to renovate in order to generate some "green," both in terms of insulating their roof, as well as a reduction in their monthly energy bills.

"The building is owned by Sundance Companies, a real estate development company," says Pat Kohls of Kohls Foam Systems, Inc. "They were interested in remodeling the building's interior to make it more energy-efficient, and wanted to add insulation to lower their heating and cooling costs. But prior to the interior remodel work, they wanted to work on the roof and to stop some minor leaks. It made sense that they would seal the outside of the building — rehab the roof — before beginning work inside."

Located in St. Cloud, Minnesota, the building endures highly humid summers and below-freezing winter temperatures. A properly sealed building envelope would help defray rising energy costs.

Stewart Swenson, the building's owner, describes the situation in vivid detail. "The building was constructed in the 1960s from steel and concrete. We have two tenants — about 250 people — sharing approximately 60,000 square feet (5,574.182 m^2)of office space. But essentially it was like a warehouse with 12-foot (3.658 m) to 18-foot (5.486 m) high ceilings and it was difficult to control the interior environment. With an estimated R-Value of three to five, we even had condensation falling inside. And if we were going to remodel the interior, it made sense to first fix the exterior which was ultimately causing the problems."

Swenson researched his options including an exterior rubber membrane roof with varying thicknesses of insulation, as well as interior applications of spray polyurethane foam (SPF). "The businesses would have to remain open during whatever remodeling work we chose, so the interior SPF applications seemed too involved for us. But an exterior SPF roof would provide a seamless option not available with the membrane roofs and I was impressed with the savings potential — as well as with Kohls' past jobs that I visited."

Kohls and his crew are no strangers to Midwestern roofs, or to energy-efficient coatings. In the SPF business since 1987, Kohls Foam Systems is located in Norwood/Young America, Minnesota. Owned by brothers Pat and Jon Kohls, the company has constantly and consistently advocated the use of cutting edge coatings technology — the very technology that has now resulted in energy savings and actual energy rebates for some of their customers. "Sundance was hoping to cut their energy usage to the point of actually reaping a rebate. And that's where SPF came in," says Kohls.

LEFT A facility owner, interested in remodeling their building's interior to make it more energy-efficient, wanted to add insulation to lower their heating and cooling costs. But in order to reap the maximum benefit, they also had to work on the roof and to stop some minor leaks. They turned to Kohls Foam Systems, Inc. to seal the outside of the building before beginning interior work.

ABOVE ▲ To spray the closed-cell foam, the crew had three foam rigs on site, one dedicated solely to working on the seams, and two for the finish. "We used a Graco H2035, H2035 Pro, and an H2 fitted with #1 tips, running 300 feet (91.44 mm) of hose on all of the rigs."

MOTHER NATURE: THE FICKLE GODDESS

With over 20 years of experience, Kohls and his six to eight-man crew figured that coating the 65,000 square foot (6038.697 m^2) standing seam metal roof would take approximately 10 to 12 days. "The roof itself was in fair condition," Kohls states. "It had been previously coated with a coating of an indeterminate nature, but it was strongly adhered to the metal substrate and could be coated over."

"The problem areas were concentrated around the fasteners which had backed out in random places, and the caulking which had failed, causing the seams to leak — also in random places. It was a straight-forward job: Repair. Recoat."

But Mother Nature had a different plan.

The building itself is open seven days a week and has a large parking lot. "The car lot always had anywhere from 40 to 200 cars in it at all times. It's located on the east side of the building and the majority of the time, we had westerly winds." Kohls can chuckle about it now, because by the job's end there were no overspray problems, but at the time it became a real issue.

"We couldn't use rolling overspray screens because the roof's standing seam metal design wouldn't accommodate the wheels," Kohls says. "We did use car covers, but there were too many cars to cover them all. The facility was helpful with moving the cars, but just when we got the cars moved, the wind would switch direction. We wound up working about a quarter of the job over the Fourth of July holiday weekend just because the building was finally closed."

If Mother Nature granted them any favors at all, they came in the form of lower-than-normal humidity. Kohls says that Minnesota's famous humidity levels were "not too bad and we could spray when the winds weren't blowing."

GREEN AS IN MILDEW

When the Kohls crew arrived at the job site, their first order of business was surface prep. "Not only did the roof have the usual accumulated dirt and debris, it also had mildew growing on it," he recounts.

Before they could begin any spray work, the crew first set up a safety perimeter six feet (1.829 m) from the edge of the roof. "The roof has an edge, and then a gutter, and then a two-foot (0.609 m) overhang," Kohls describes. "And we stopped spraying short of the gutter, so we didn't need to wear harnesses or to be tied off. All of our ladders, however, were strapped down."

The crew also wore 3M cartridge respirators, gloves, Tyvek pants, and safety glasses. When pressure washing the surface, they also wore rubber boots.

To pressure wash the roof, they used four Graco 40/30 3,500 psi (24,131.651 kPa) pressure washers. Working methodically, they divided the roof into 12 rib sections. Once the entire roof had been given an initial cleaning, the Kohls team reached for Hudson sprayers filled with Conklin's WAC II, a weathered acrylic roof cleaner. "We spray-apply the WAC to soften any remaining debris and help

remove surface tension," says Kohls. "We let the WAC sit for 10 minutes, then we power wash it off of the roof using water and the Graco power washers."

In all, the surface prep power washing process took three days. Kohls compares cleaning this 65,000 square foot (6,038.697 m^2)coated roof to cleaning a 127,000 (11,798.69 m^2) square foot galvanized roof: "Our four-man crew used the same equipment and cleaned the galvanized roof in half the time because it was that much cleaner to begin with than this one." But neither wind, nor dirt, nor mildew could stop Kohls and his motivated crew.

TRIAL AND ERROR LEAD TO COOL COATINGS

The specs called for the use of BASF FE 348-2.8 pound (1.134 kg) SPF, which is described as an "HFC-blown, zero-Ozone depleting, SPF system" designed to be applied at a minimum thickness of two inches (5.08 cm).

"We again divided the roof into quarter sections," Kohls says. "It was part of a plan to logically attack the roof and not reapply over foam on different days. After a section was completed the tie-in areas were primed with Conklin's PrimeTime at a rate of a half gallon per square (dry mil thickness of around five mils or 0.065 mm) before we foamed the next section." But as with everything else on this roof, the foam application was not to be a straight-forward process.

"It was a process of trial and error to seal the ribs," Kohls explains. "We had to come up with a way to put down two inches (5.08 cm) of foam and still be aesthetically pleasing. It took several tries, but finally we found a process. By running up the seam on one side and down on the other, and then back with one pass, we found that we could get two inches of foam without any uneven areas."

To spray the closed-cell foam, the crew had three foam rigs on site, one dedicated solely to working on the seams, and two for the finish. "We used a Graco H2035, H2035Pro, and an H2 fitted with #1 tips, running 300 feet (91.44 m) of hose on all of the rigs." Once the seams were sealed with foam, the rest of the roof followed easily.

After the foam had cured, it was time to spray-apply a base and top coating of Roof-Tek's Acry-Tek 4200. "The crew used Graco 733s to spray the Roof-Tek 4200 base coat on top of the BASF FE 348," says Kohls. The Acryl-Tek 4200 system is a two-coat, single-component, 60 percent solids emulsion polymer based-on elastomeric, 100 percent aliphatic/acrylic resin. Applied at 27 dry mils, it is designed to provide weatherability, as well as UV protection. It also carries an ENERGY-STAR label.

Although the product data sheet (PDS) specifies a cure time of four to eight hours depending on temperature and humidity, "After applying the base coat, we let the roof cure for a day before returning to apply the top coat," Kohls states. "We used the same Graco 733s and spray-applied the Roof-Tek Acry-Tek 4200 top coat to give the entire base and top coat system a thickness of 27 to 30 mils (0.686 mm - 0.762 mm) DFT."

JOB AT A GLANCE

PROJECT:

Repair and recoat 65,000 sq. ft. (6,038.697 m^2) standing seam metal roof

COATINGS CONTRACTOR:

Kohls Foam Systems, Inc.
10945 Sunset Road
Norwood/Young America, MN 55397
(612) 708-4111
www.kohlsfoamsystems.com

SIZE OF CONTRACTOR:

8 to10 employees. A 6 to 8-man crew worked this project

SUBSTRATE:

Standing seam metal roof

SUBSTRATE CONDITION:

Structurally sound, but fasteners backing out and seams leaking

SIZE:

65,000 sq. ft. (6,038.697 m^2)

DURATION:

20 days

UNUSUAL FACTORS:

- Building open seven days a week and parking lot continually had between 40 to 200 cars in it at any given time
- Parking lot located on east side of building and most days there was a strong wind from the west
- Roof's standing seam metal design wouldn't easily accommodate use of overspray screens, so crew had to closely monitor winds and work in conjunction with facility's management to move cars

MATERIALS/PROCESS:

- Pressure wash with water using four Graco 30/40 3,500 psi (24,131.651 kPa) pressure washers
- Following water wash, use three Hudson Sprayers to spray roof with WAC II cleanser to soften remaining debris
- Pressure wash with water to remove cleanser and debris using four Graco 30/40 3,500 psi (24,131.651 kPa) pressure washers
- Spray-apply 2" (5.08 cm) of BASF 348 .28lb (1.134 kg) foam using Graco H20 35, H20 35 Pro, and H2 rigs
- Spray-apply 27 – 30 mil (0.686 mm - 0.762 mm) DFT base coat of RoofTek 4200 using Graco 733 rigs
- Spray-apply 27- 30 mil (0.686 mm - 0.762 mm) DFT top coat of RoofTek 4200 using Graco 733 rigs

SAFETY CONSIDERATIONS:

- Crew used safety lines around the perimeter 6' (1.829 m) from the roof's edge
- Crew strapped down ladders
- Crew wore 3M cartridge respirators while spraying as well as Tyvek pants, gloves, safety glasses, and rubber boots (while pressure washing)
- Crew held daily safety meetings

ABOVE ▲ "It was a process of trial and error to seal the ribs," Kohls explains. "We had to come up with a way to put down 2" (5.08 cm) of foam and still be aesthetically pleasing. But by running up the seam on one side and down on the other, and then back with one pass, we found that we could get 2" (5.08 cm) of foam without any uneven areas."

ABOVE ▲ The owner is pleased with his new roof. Swenson says, "Although we've only gone through a part of one summer and one winter, already we've noticed a difference. The A/C was on less during the summer months and we absolutely saved on gas over the winter…I like to think of the seamless membrane roof as the candy shell on the building."

And that was that. Although thanks to Mother Nature it took twice as long as expected, Kohls and his crew were able to turn the roof over to the owners without incident.

GREEN AS IN CASH

What do the owners think of the new roof? "Right away they noticed a decrease in temperature fluctuations," Kohls says. "They've told us that it is much easier to keep the building's interior at a constant temperature. And, of course, the water leaks have stopped."

Swenson agrees. "Although we've only gone through a part of one summer and one winter, already we've noticed a difference. The A/C was on less during the summer months and we absolutely saved on gas over the winter. It has definitely stopped the condensation. The air is consistent throughout the building. Obviously maintenance will be a key factor, but I like to think of the seamless membrane roof as the candy shell on the building."

And that candy shell has indeed been a sweet deal. In addition to the savings evidenced in the monthly utility bill, Sundance Companies also realized a direct return on their investment. "They were able to apply for and receive a rebate from Xcel Energy by using an ENERGY-STAR labeled roofing system," explains Kohls.

Swenson describes the return on his investment: "All told the roof cost about $200,000, and we got about 10 percent back in an instant rebate from Xcel Energy because the building went from an R-3 to R-5 rating to an R-18. According to my calculations, because of the roof, I stand to save 10 to 20 thousand a year in energy costs."

According to Xcel, they offer the ENERGY-STAR discount because these "roofing products perform well in our diverse climate, are reflective, and lower roof surface temperature by up to 60°F (15.6°C) on hot days, and decrease the heat transferred into the building."

Saving the environment and saving money usually seem to be mutually exclusive concepts. But not when the topic is green roof coatings and energy savings. For proof, just ask Stewart Swenson of Sundance Companies. He'll be happy to talk about his new SPF roof. Or, ask the hard-working team from Kohls Foam Systems, Inc. For the past 20-plus years they've been working to make the world a little more energy-efficient, one freshly coated roof at a time. CP

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