Roof Coatings: White Is The New Green

BY JEN KRAMER

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What do you do when your "green practices" company headquarters – founded with the goal of saving people money through energy-efficient lighting – is in need of a new roof? The owners of Envirobrite in Sanford, Florida, knew that their leaking 26-gauge, galvanized metal roofs needed attention, but they wanted to approach the roofing project in the most environmentally friendly, energy-wise manner possible.

Research led them to a like-minded coatings contractor, Commercial Coating Pros (CCP), located up the road in Daytona Beach. "I spent many hours working with Kyle Eyrich, the production manager at Envirobrite," says Guy Beasley, co-owner of CCP. "This was a big investment for them and he [Eyrich] needed to know how it would benefit his company. Aside from the waterproofing, which was obviously a huge concern, this product would change the buildings' heat signature." The two men spent six months "working through the details of this job," notes Beasley.

GOING GREEN AND SAVING GREEN

Using guidelines supplied by Florida Power and Light, the two men developed a spreadsheet showing how the "cooling load would be impacted by the application of an 88 percent reflective roof coating." That coating was Gaco Western's S-20 silicone roof coating. And, given Eyrich and Beasley's careful calculations — when properly applied to Envirobrite's 60,000 square feet (5,5574.18m^2) of roofing spread over two buildings — the coating would allow the company to qualify for a rebate of $.45 per square foot from Florida Power and Light's Building Energy Efficiency program. "The estimated rebate was around $18,000," Beasley recounts.

And not only would the Gaco S-20 save Envirobrite "green" in terms of money, it is formulated to be "green." "We calculated that it would take approximately 1,500 gallons (5,678.12L) of the S-20 silicone," Beasley says. "That quantity of a typical coating would usually contain approximately 600 gallons (2,271.25L) of solvents. By using a solvent-less coating, we prevented 600 gallons of solvents from being released into the air."

The highly reflective white roof coating would also help with heat transfer inside the buildings. "Here in hot, muggy Florida, the months of December, January, and February are usually the only times that we don't have to run air conditioners," Beasley says. "With the roof properly sealed and the new white roof coatings reflecting the sun, Envirobrite can go an even longer stretch without needing to turn on the A/C."

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ABOVE ▲ Beasley asks, "Do you know what your back does when you're bent over for six straight days doing screws? Brutal. But it is so important because that's where those leaks come from…thousands of heat cycles – hot, cold – those screws just pop."

LEFT ◀ The crew used a Graco X-70 and a Graco 56:1 Bulldog to apply the Gaco Western S-20 solventless silicone coating system in white at a thickness of 30 mils (0.76mm) DFT to the entire surface of both roofs.

FLORIDA'S WINTER: GREEN AND COLD?

But with all of this careful planning and consideration, it was winter by the time the CCP crew could climb onto the roofs and begin coating.

"Of course, no one thinks of Florida as a particularly cold climate," Beasley chuckles. "But we had an unseasonably cold winter that forced us to pay extra close attention to the thermometer. We were averaging daytime highs in the 30s (-1°C)."

Fortunately, the CCP crew was able to store the product in totes, indoors, in the climate-controlled warehouse. "We also preheated the coatings when necessary, using drum and radiant heaters," Beasley says.

Not so surprising for Florida — at any time of year — was the wind and the rain. And the experienced crew was more than prepared for these elements too.

"This is a two-shift manufacturing facility that needed to remain open and unfettered during our process," Beasley explains. "We knew that wind and the potential for overspray would be high. In fact, there were days when the wind speeds were clocking 25 mph (40.23km/h). With speeds like that, a pressurized coating can travel for miles. And despite the most stringent warnings, people will drive under caution tape." So the CCP crew took elaborate measures to avoid any overspray.

First, they built windscreens. Then, in order to prevent pressurized, spray-applied coatings from flying through the air, they essentially rolled the product onto the roof. "We would pump the product up to the roof using our air compressor-driven Graco

ABOVE ▲ Prior to the top coat application, the crew spray-applied Gaco Western's GacoFlex E-5320 epoxy primer to the roof surface at a rate of 1 gallon per 300 square feet (1L per 27.87m²). They also applied 2,500 board feet of Gaco Western PolyFoam 273 spray polyurethane foam onto the "problem areas: wall tie-ins, ridge caps, and equipment penetrations."

JOB AT A GLANCE

PROJECT:
Recoat approximately 60,000 sq. ft. (5,5574.18m²) of galvanized metal roofing over two buildings in midst of Florida winter

COATINGS CONTRACTOR:
Commercial Coating Pros
1025 6th Street
Daytona Beach, FL 32117
(866) 846-6145

SIZE OF CONTRACTOR:
10 employees; A four to five person crew worked this project

PRIME CLIENT:
Envirobrite, Energy Planning Association
148 Maritime Drive
Sanford, FL 32771
(407) 302-0001

SUBSTRATE:
26-gauge galvanized steel

SUBSTRATE CONDITION:
Fair, some rust, leaking at seams, screw heads, fastener heads, and around the perimeter walls

SIZE:
First roof approximately 33,780 sq. ft. (3,138.82m²), Second roof approximately 31, 500 sq. ft. (2,926.91m²)

DURATION:
Three weeks

UNUSUAL FACTORS:
- Two-shift manufacturing facility needed to remain open throughout project; had to constantly move cars to avoid overspray
- Female crew leader
- Based on amount of coatings used, solvent-less silicone coating helped prevent an estimated 600 gallons (2,271.25L) of solvents from being released into atmosphere
- Reflective roof coating eligible for rebate through Florida's Building Energy Efficiency Program
- Cannot spray coating in rain, but if substrate gets wet an hour after coating, it will not be damaged

MATERIALS/PROCESS:
- Pressure wash roof using Ridgid 3600 psi pressure washer and water
- Inspect fasteners, tighten or replace with oversized fasteners if needed
- Using Graco HydraMax 300, spray-apply Gaco-Western E-5320 epoxy primer to roof at coverage rate of 1 gallon per 300 sq. ft. (1L per 27.87m²)
- Using custom-made roofing foam proportioner from Polymer Processing Co. Inc., spray-apply Gaco-Western PolyFoam 273 to problem areas (i.e.wall tie-ins, ridge caps, equipment penetrations) at average thickness of 1" to 4" (2.54cm to 10.16cm)
- Hand-apply custom-blended slurry consisting of Gaco S-20 Silicone mixed with micro-fibers onto approximately 80,000 screw heads
- Using Graco X-70 and Graco 56:1 Bulldog, spray-apply Gaco-Western S-20 Silicone coating onto entire roof surface at thickness of 30 mil (0.76mm) DFT

SAFETY CONSIDERATIONS:
- Crew wore gloves, face masks, eye and ear protection, as well as steel-toe boots
- Fall prevention consisted of anchor points with self-retracting lifelines to which the crew hooked five-point fall protection harnesses

equipment, but we'd take the tip off of the gun so that it wasn't atomized. Then we would roll and backroll," Beasley says.

The crew would also ask Envirobrite employees to move their cars if necessary. And if that failed, "We carry 30 or 40 car covers in our trucks for cars we can't move. There were even two or three days where the wind was blowing too hard and we had to stop altogether. Thankfully, with nearly 1,500 gallons (5,678.12L) of primer and coatings sprayed, we had no overspray issues," Beasley gratefully states.

They were also more than ready to deal with the rain; roof coating in Florida has given the experienced CCP crew more than enough practice with the occasional rain shower. However, the silicone coating provided a different "rainy day" experience from the acrylics with which they typically work.

"The Gaco S-20 doesn't have near the wash-off potential as acrylics do," Beasley says. "It can be a little more difficult to handle, but none of it hits the ground like the acrylics used to. We can't spray it in the rain and the substrate must be dry when it is applied; but if it rains even an hour after it is applied, the coating will not be damaged."

This discovery came as a nice surprise to a Florida crew who had seen the skies unexpectedly open up and ruin freshly coated roofs in the past. Now, Mother Nature can rage all she wants. In this one instance, science has perhaps beaten her at her own game. "It rained and we didn't have to worry. That is a big deal," Beasley says with enthusiasm.

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ABOVE ▲ "People are always surprised when our crew pulls up for the first time to see that our crew leader is a woman, Angela Gorman" Beasley chuckles.

NO GREEN NEWBIES ON THIS CREW

With all of the careful pre-job planning, it is a wonder that there were any surprises and, yet, there was one more. This time for Envirobrite.

"People are always surprised when our coating crew pulls up for the first time to see that our crew leader is a woman," Beasley chuckles.

The leader of the crew of six, Angela Gorman has been with CCP for approximately three years, working her way up and earning the respect and admiration of her crew members in the process.

When asked about her unique role, she says she "just fell into it." But be that as it may, it is clear that on each job, she sets the pace and the team has to keep up with her.

And in this case, they had three weeks to prep, inspect, and recoat 63,786 square feet (5,925.91m^2) of leaking 26-gauge, galvanized, exposed-fastener metal split between two buildings. "The first roof was 33,786 square feet (3,138.82m^2) and the second roof was 31,500 square feet (2,926.91m^2)," Beasley says. "The staggering number though was the number of screw heads that had to be dealt with…there were approximately 80,000 of those."

But before any of those screw heads could be inspected, the roof itself would need to be cleaned.

The crew first installed the anchor points for their self-retracting fall protection lines. Each crew member wore a five-point safety harness. To this they added Tyvek suits, safety glasses, steel-toed boots, and gloves.

Properly protected, it was time to prep the roof. Using Ridgid 3600 psi machines, Gorman and crew pressure washed the roof with plain water.

Then they inspected all fasteners. If the fastener lacked mechanical bite, or exhibited signs of rust, it was removed and

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replaced with an oversized fastener. "Some fasteners were in good condition but were just loose. Those were simply tightened," Beasley says.

GOING GREEN BY SPRAYING WHITE

Once all of the fasteners had been inspected and tightened or replaced, it was time to apply the primer. Using a Graco HydraMax 300, the crew spray-applied Gaco Western's GacoFlex E-5320 epoxy primer to the roof surface at a rate of 1 gallon per 300 square feet (1L per 27.87m²).

The primer was followed by the application of 2,500 board feet of Gaco Western PolyFoam 273 spray polyurethane foam onto the "problem areas: wall tie-ins, ridge caps, and equipment penetrations." Beasley explains that: "We use a custom-made roofing foam proportioner from Polymer Processing, Inc. to spray-apply an average of 1" to 4" (2.54cm to 10.16cm) of SPF in some areas and to create a curve at transitions. We've found that SPF applied in these typically problem areas creates a tough, durable bridge that coating alone sometimes cannot manage."

But it was after the "problem areas" were addressed that the job got rough. The crew had to encapsulate each and every one of those 80,000 screw heads — by hand. Beasley asks, "Do you know what your back does when you're bent over for six straight days doing screws? Brutal. But it is so important because that's where those leaks come from…thousands of heat cycles — hot, cold — those screws just pop."

In order to protect the screws, CCP mixes their own paste-like slurry. "We use Gaco's S-20 silicone mixed with microfibers to make our own caulking that matches the chemistry of the roofing product." The crew mixes the caulking on site and hand-applies a "40 to 50 mil (1.02mm to 1.27mm) dollop about the size of a quarter which will then be coated by another 30 mils (0.76mm) of the coating system," Beasley explains.

After some well-earned back stretches, the crew was ready for the last step, applying that 30 mil (0.76mm) DFT coating system. Using a Graco X-70 and a Graco 56:1 Bulldog, the CCP crew applied the Gaco Western's S-20 solventless silicone in white to the entire roof surface. Working both roofs took six days. Beasley recounts that the elastomeric roof coating stays so cool that it was "nearly impossible to dry because it develops no heat. The finished roof will not evaporate dew." That is one cool roof.

Of course, the roof coatings did cure. And the CCP crew finished the project on time. And Envirobrite is pleased with their new white-colored "green" roof. "They really did their homework," says Beasley. And it has paid off. The company, which manufactures energy-saving light bulbs, is in turn being rewarded for their energy-saving roof efforts. "Since we are a certified coatings contractor with Florida Power and Light and the Gaco coating qualifies, the building is entitled to a rebate under the Building Energy Efficiency Program." No wonder green — or rather white — is such a popular color these days. CP