CARLISLE SYNTEC SYSTEMS

FleeceBACK® TPO Roofing Systems

CASE STUDY

InsulBase® POLYISO Insulation

FlexibleFAST™

Protecting Precision: Carlisle's FleeceBACK System Shields New Aircraft Facility

JOB PROFILE

PROJECT LOCATION:
Oklahoma City, Oklahoma

CARLISLE APPLICATOR:
Coontz Roofing

BUILDING OWNER:
Seefried Properties

ROOFING SYSTEM:
- 115-mil white FleeceBACK TPO
- 1.75" InsulBase Polyiso Insulation
- Flexible FAST Adhesive

In 1925, the pioneer of air-cooled radial airplane engine design, which offered unprecedented power-to-weight ratio, established a company that would become a global leader in the design, manufacture, and service of engines that power today's most advanced aircraft. Since then, these engines have transformed military and commercial aviation; today, the company has more than 85,000 engines in service and approximately 17,000 customers worldwide.

In mid-2023, the company started construction on a new aircraft engine component warehouse in Oklahoma City. The facility was designed to serve as a hub for depot support for military engines maintained at Tinker Air Force Base and other depot locations, including those for the F-35, C-17, F-22, F-15, F-16, B-52, and E-3 AWACS.

The new facility was developed by Seefried Properties based in Atlanta and designed by Pross Design Group of Dallas. Benchmark, Inc., a leading national roof consulting firm based in Cedar Rapids, Iowa, was hired as a consultant to oversee the roofing work on the massive facility.

The new warehouse is situated on an 85-acre site and includes 842,043 square feet of warehouse space with 40-foot clear heights, generous concrete truck courts, over 100 dock-high doors, six grade-level doors, and 103 trailer spaces. The 54-foot-tall facility also includes a two-story, 86,000-square foot, state-of-the-art office area. The roof is approximately 800,000 square feet in size.

WAREHOUSE – OKLAHOMA CITY

Coontz Roofing, based in Edmond, Oklahoma, is a long-time Carlisle Authorized Applicator and one of Carlisle's top installers of FleeceBACK membrane. The firm was hired as the roofing contractor for the massive project that would protect the company's valuable inventory.

The new warehouse is Factory Mutual (FM) insured and located in an area that required the roofing assembly to meet its 'very severe hail' (VSH) classification. The facility has a concrete tilt-up façade that was poured on site, a 22-gauge steel roof deck, and a parapet wall around the entire 570 x 1,400-foot perimeter of the facility which ranges in height over the deck from about four feet at the peak to nearly 10 feet along the eaves. At the outset of the roofing work, much of the steel decking, and some of the trusses, had not been installed.

To meet the original completion date goal, the timeline called for Coontz to install 10,000 square feet of roofing per day, including throughout the winter months.

"Given the size of the project and the oncoming winter, installing 10,000 square feet a day certainly seemed like a stretch goal for us at the outset," said Scott Coontz, president of Coontz Roofing.

To meet FM's stringent VSH windstorm classification, the roofing assembly consisted of two layers of 4 x 8-foot sheets of Carlisle's 1.75-inch InsulBase Polyiso Insulation, A VSH rated cover board with one portion of the roof utilizing ⅝" DensDeck® StormX™ Prime, and Carlisle's FleeceBACK TPO. The first step was to loose-lay the polyiso insulation directly on the steel deck and stagger the joints for maximum efficiency.

"We were moving really quickly once the deck was in place and had six truckloads of iso delivered every week just to keep up with our production," said Coontz.

Throughout the project, a representative from Benchmark was on site several days a week. Their job was, in part, to play the role of quality inspectors to make sure that the roofing system on this important facility was installed correctly.

The Coontz Crew mechanically fastened the 4 x 8-foot coverboard through the insulation with eight InsulFast™ Fasteners and three-inch plates per board in the field of the roof, 16 fasteners in the 32-foot-wide perimeter zone, and 32 fasteners in the 32 x 32-foot corner zones.

"The crew really liked the coverboard," said Coontz, "and we will definitely use it again."

Once the crew had installed enough squares of insulation and coverboard, the membrane crew went to work.

"We love the FleeceBACK membrane," said Coontz, "and as one of Carlisle's top two or three fleece installers in the country, we are very well-versed in working with it and really good at installing it!"

The membrane specified for the project was 12-foot-wide, 115-mil Carlisle FleeceBACK TPO featuring Carlisle's exclusive Octaguard XT™ weathering technology, which is designed to withstand severe weather and hail in

> "… on some days **we were able to install over 25,000 square feet of membrane,** even during the winter."

climates like that of Oklahoma City. The fleece membrane also offers 33% greater puncture resistance compared to 60-mil TPO membrane, which was important and beneficial for this project.

To secure the membrane to the deck, the Coontz team used 50-gallon drums of Carlisle's Flexible FAST Adhesive, a two-part polyurethane adhesive, applied in four-inch beads directly to the substrate using both heated Predator and HULK spray rigs. The adhesive pattern offers superb wind performance for this application and location. Once applied, the fleece membrane was rolled into the adhesive, brushed down, and then rolled in with a 150-lb. segmented roller.

Having the large, heated adhesive spray rigs was critical for the application, as the roof was being installed through the cold winter months. While Carlisle's Flexible FAST Adhesive can be applied in ambient temperatures as low as 25°F, there were several days during the installation when the temperatures were lower, so the heated rigs made it easy to maintain the adhesive at the required 70°F during application.

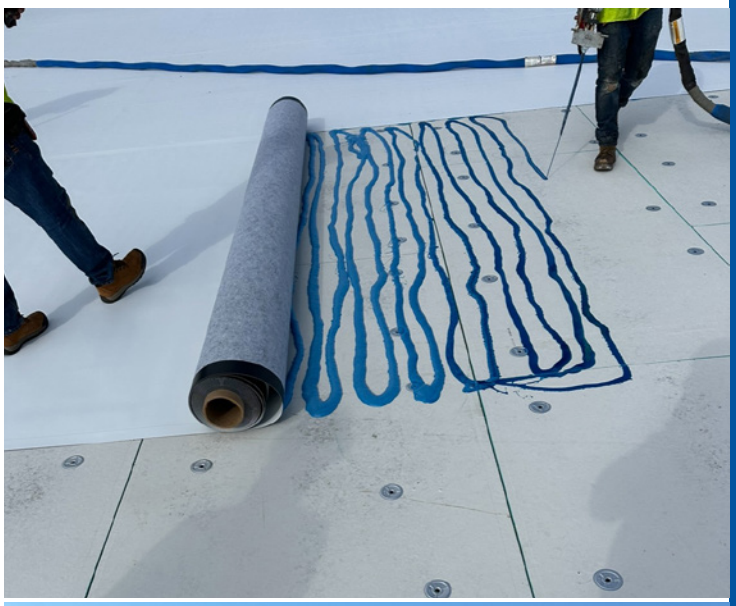
In addition, the FM-approved adhesive has been shown in independent tests to increase puncture resistance between 33-50% compared to traditional two-component low-rise adhesives, which was important for this project and the VSH classification requirements.

"The roof was pretty wide open, which allowed us to get some really great productivity," said Coontz. "In fact, on some days we were able to install over 25,000 square feet of membrane, even during the winter. I was very happy with the productivity we achieved."

While fairly open, the roof does have a series of internal and overflow drains spaced about 100 feet apart, along and around the perimeter. The steel deck was designed with built-in crickets for drainage.

"The built-in crickets really helped to save a ton of installation time," said Coontz. "Instead of having to make crickets with tapered insulation for each drain we just installed insulation on the sloped decking, which worked out really well."

Coontz terminated the membrane on the parapet wall around the facility.



CASE STUDY

WAREHOUSE – OKLAHOMA CITY

For this detail, they first terminated the membrane at the base of the wall with fasteners and plates, then welded a flashing membrane at the deck level, which was run up the wall about a foot and terminated with 10-foot sections of term bar. A shop-fabricated metal counter flashing was installed over the top of the term bar around the entire perimeter.

The last step of the process was to install the company's logo on the roof of the facility. The logo is made with a custom-color, 60-mil membrane provided by Carlisle, and hot-air welded in place on the center of the facility's roof.

"I believe that this is the first project where Carlisle has developed a custom color membrane for a company logo," said Coontz, "and it's a great way to top off this high-profile project."

The logo is nearly 1,000 feet long, and each letter is 100 feet tall. To ensure that it was perfectly positioned, Coontz hired a surveyor to help with the alignment. Then the Coontz team adhered each letter in place and hot-air welded the edges of each one for a permanent application.

"The logo came out great," said Coontz. "It looks awesome, and our team did a great job getting it installed."

In the end, Coontz Roofing completed the project a full 45 days early, a monumental outcome for a project this size, particularly when being installed through the winter months.

"We were very happy with the finished roof," said Coontz, "and I am very proud of my team and the great work they did on the new warehouse."

Coontz Roofing, a Carlisle Authorized Applicator since 2014, recognized for its outstanding performance and numerous prestigious awards:

ESP PERFECTION AWARD

FLEECEBACK CHAMPIONS CARLISLE SYNTEC SYSTEMS

CARLISLE HALL OF FAME APPLICATOR CENTURION

800-479-6832 | P.O. Box 7000 | Carlisle, PA 17013 | Fax: 717-245-7053 | **www.carlislesyntec.com**