

Project Profile

Wind Tunnel Project

When researchers with the University of Texas at Austin needed to build a high-performance wind tunnel for rocket, aircraft and rotocraft engine sound testing, they turned to a local spray foam insulation contractor for help.

Dr. Charles E. Tinney, a research professor with the Department of Aerospace Engineering and Engineering Mechanics was building an open-jet wind tunnel with an anechoic chamber for aeroacoustics and experimental fluid dynamics testing.

“The wind tunnel and anechoic chamber are designed with special walls that trap the sound so that it does not reflect back and contaminate our measurements,” Tinney said. He collaborates with organizations such as NASA and AFOSR to better understand the noise generated by high-performance engines and the impact that the sound vibrations have on people and critical systems.

As Tinney researched the insulation options for the project, he became interested in spray polyurethane foam which is typically used in residential, commercial or industrial structures to air seal and insulate.

“We wanted something that would fill the wall space and completely seal it off,” says Dr. Tinney in reference to the wind tunnel. “The foam seals in all the cracks, so it gives a full coverage of the area I’m insulating. For a wind tunnel, an airtight seal is critical. Cotton fiber doesn’t give you the seal you get with spray foam. [The foam is] lightweight as well and provides us with sufficient sound absorption qualities.”

When Dan Amon, owner of BioTex Foam Insulation and an approved contractor of BioBased Insulation®, was approached by Tinney, he was excited about the opportunity to use spray foam insulation in the unusual project.

“The wind tunnel is made of 2 x 12 studs with 3-quarter plywood screwed and glued together,” Amon said. “This thing was a giant cube. You could roll it down a hill, and it wouldn’t lose its shape. The forces of wind that were going to be exerted on it would be tremendous, so it needed to be built strong.”

The final structure includes a layer of acoustical wedges, perforated sheet metal, cotton batts and 11 inches of BioBased 501®, an open cell spray foam insulation in the wind tunnel’s sidewalls and roof.

Tinney could not be more satisfied with the outcome of the SPF application. “Spray foam allows us to achieve an acoustically treated environment in which we can conduct our tests.”

View the project photo album on Facebook.
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