# SILVER LININGS

## A SERIES OF SBIR CONTRACTS LED A SMALL WYOMING COMPANY FROM AIRCRAFT COVERS TO THE PRESIDENTIAL FLEET

In 2006, a small Wyoming manufacturing company specializing in aircraft covers applied for a $5,000 Phase Zero Small Business Innovation Research (SBIR) grant from the state of Wyoming. Ten years and several federal SBIR contract awards later, that company—Kennon Products—designed, manufactured, and installed a state-of-the-art cabin liner system for use in the Presidential V-22 helicopter fleet.

Kennon began its journey into the realm of SBIR at the suggestion of an enthusiastic chemical engineer, Mark Weitz. At that time, the U.S. Marine Corps was looking to improve a system for attaching the interior insulation system of the Bell Boeing V-22 Osprey. Weitz, now Kennon's vice president of research and development, urged the company to apply for the

state grant and use the funds to visit Naval Air Station Patuxent River (NAS Pax River), where the aircraft was being tested.

Officials with NAVAIR "agreed to have us out, and they don't always do that," Weitz said. "That was really critical." Weitz and Ron Kensey, Kennon's founder and president, were able to visit and see the issues with the existing V-22 fastener system firsthand.

"When we got on board the aircraft we couldn't help but notice how tattered and oil-soaked the insulation system was," Weitz remembered. The aircraft clearly needed a better system, and NAVAIR asked if Kennon would be able to devise it. "Our answer was 'yes' and we presented it in a phase one proposal," Weitz said.

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The initial proposal focused on an improved fastener system. The existing system had been developed for earlier aircraft, including Chinook helicopters. It did not convert well to a composite aircraft like the V-22; attachments were stationary, difficult to install, and could damage the aircraft when removed. Kennon's team created a composite utility clamp that could be more easily installed and removed, thus minimizing damage to the aircraft frame. The clamp became a central piece of subsequent SBIR efforts.

Next, Kennon addressed the sagging, quilted blanket system with a streamlined cabin liner. Using an aerospace foam and composites, Kennon created a sleek, form-fit cabin liner with acoustic and thermal properties. It weighed less than 75 pounds and could be installed in about 45 minutes. Installation of the previous system could take two days, largely due to the problematic fasteners.

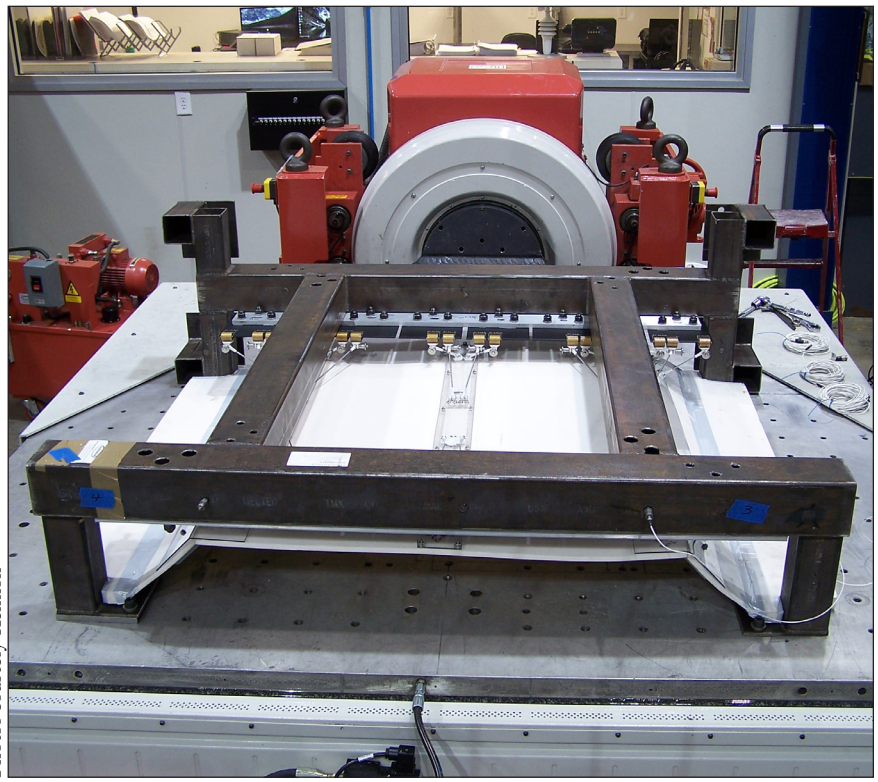
Kennon kept improving its system through several SBIRs, culminating in late 2016 when the company outfitted twelve V-22s in the Presidential Greenside Fleet — Marine Helicopter Squadron One or HMX-1 — which transports presidential support staff, high-level office holders, foreign dignitaries, and other VIPs.

Early in the process, Kennon had proposed a third element that piqued NAVAIR's interest: ballistic protection. The company received a few bridge funding contracts to develop ballistic elements, and in 2017 the company received an additional SBIR award to explore ballistic protection for newer aircraft platforms.

"They came back and have been working with us to further develop the ballistic capabilities," Weitz said. "So the three little roots that got planted in the ground created a pretty interesting tree or garden, if you will, for these technologies."

Kennon's early history, in the 1980s, centered on designing and manufacturing aircraft covers for private and commercials planes that would protect against corrosion, sand intrusion, heat build-up, and damage caused by the elements. Today, the company's engineering team works with advanced fabrics to create a wide range of products for high value equipment in both the military and commercial sectors. Examples include covers for the F-35 Lightning II, radiation shields for the KC-46, an air tanker, and rodent-proof covers for

With help from the SBIR program, Kennon created cabin liners good enough for the presidential fleet.



Photos courtesy Kennon

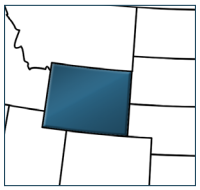
Each cabin liner panel created by Kennon undergoes testing prior to delivery.

the Los Angeles Dodgers stadium.

In the early days, Kennon designs "were often done in the field, with paper, plastic, and tape," according to Chief Executive Officer Joe Wright. In 2010 the company transitioned to use of computer-aided design (CAD) with the help of MilTech, a U.S. Department of Defense technology transition partnership intermediary operating out of Montana State University.

Transitioning from 2-D to 3-D was important — and difficult, Wright noted. MilTech helped the company create CAD software for its engineering designs. It also provided support to Kennon for the implementation of an ISO 9001 certified quality management system, which is required for government and other high-profile contracts.

Today, Kennon products are digitally designed and produced with state-of-the-art materials. The company employs 41 people in its R&D and manufacturing facilities in Sheridan, Wyoming, a town of about 20,000 people.



Kennon continues to innovate in many directions; it has added to its U.S. Department of Defense offerings and has reached out as far as the behavioral health sector with the Soft Suicide Prevention Door. However, SBIR contracts remain in the company's focus, Wright said, and will continue to help in the development of more lightweight, reliable products for warfighters.

Both Wright and Weitz acknowledged that while the cabin liner itself is not central to the company's bottom line, the process of developing it was invaluable: The experience allowed Kennon to navigate several SBIRs and motivated the company to establish a certified quality management system.

"I don't see the cabin liner being a large part of our business, but it was a very momentous and important point in time for us and definitely a success," Wright said, then added, "the company is inspired by and committed to the protection of high-value assets, from aircraft and other essential equipment, to the most important asset: life."

**Kennon Products, Inc.**

Modernization Priority: General Warfighting Requirements (GWR)

Sheridan, WY • SBIR contract: N68335-08-C-0021 • Agency: Navy • Topic: N06-016, Cabin Insulation System for the V-22