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Coast Guard Solves Slat Corrosion on Twin-Engine Falcon

By Cynthia Greenwood

To fulfill its daunting missions in law enforcement—from surveilling oil polluters and policing fisheries in international waters to its legendary, Hurricane Katrina-style search-and-rescue—the U.S. Coast Guard relies on a twin engine jet known as the HU-25 Falcon. After testing several corrosion mitigation techniques for preserving the Falcon's slat surfaces, USCG officials have determined that a polymer coating manufactured by Pittsburgh-based Sermatech International has solved the aircraft's persistent problem with slat corrosion.



The highly corrosive sea environment—particularly its temperature and moisture extremes—tends to degrade the wing's leading edge.

This wing section includes an instrumental slat system prone to corrosion and expensive overhaul measures, said Lt. Commander Charles Hatfield, an HU-25 Engineering Officer. The slat system is constructed from 2024-T4 aluminum with steel fasteners.

"The slat is a high-lift device that consists of a double skin of aluminum that provides a passage for warm air de-icing," Lt. Cdr. Hatfield explained. "The wing's leading edge houses the thermal anti-icing system and must be capable of withstanding environmental attack while operating at high temperatures."



The color of a polymer coating used to protect the slat of a twin-engine Falcon resembles that of its anodized surface. Photo courtesy of U.S. Coast Guard.

The Coast Guard's Aircraft Repair and Supply Center has had little success with corrosion-prevention methods other than the polymer coating, Hatfield said. Waxing the anodized slat surfaces proved less than successful. Other less fruitful methods included coating the slats with original equipment manufacturer-recommended polyurethane, as well as ceramic and liquid glass. So Hatfield's team authorized the use of Sermatech's Shorcoat™ on 13 slats on five aircraft that had logged more than 900 flight hours in two Coast Guard air stations in Miami, Florida, and Corpus Christi, Texas.

"The polymer coating has a color that is very similar to the original anodizing of the slats," Hatfield said. "It appears to hold up very well to temperature extremes and is erosion- and corrosion-resistant. The coating is also easy to repair in the field for any scratch or cut that may occur."

It costs \$540,000 to overhaul one aircraft's slat system, according to a Coast Guard report on the polymer coating's benefits. "The cost of the coating is \$2,400 per slat, which results in a cost avoidance of \$87,600 per slat," Hatfield noted. While the use of the polymer coating requires an extra step before the slats can be returned to service, it produces a piece of aircraft anatomy with corrosion resistance and a "uniform, cosmetically attractive finish."

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