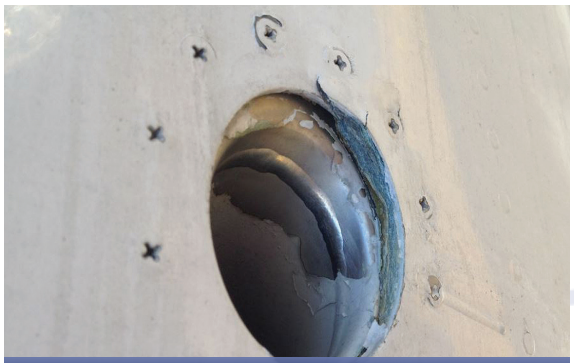

Example of failing corrosion inhibiting compound (CIC)


Fuselage skin and frame corrosion damage – moisture penetrated through CIC, primer, and chemical conversion


Fuselage skin corrosion damage – moisture from exhaust vent penetrated through organic-based top coat, primer, and chemical conversion


Fuselage cargo door cutout structure – moisture penetrated through CIC, primer, and chemical conversion

AeroPel™ APW100 - Airframe Protection Series

The APW100 Airframe Protection Series is a water-based Nanocomposite Protective Layer (NPL) developed to provide superior protection for metallic airframe structures and components against corrosion damage.

The NPL features an omniphobic surface to repel all fluids, one of the basic principles to maintain a corrosion-free environment. In addition, the NPL is resistant to chemicals and abrasion to provide a durable protection for the substrate. AeroPel NPL is formulated specifically for the aviation industry to benefit at many levels.

Key Benefits:

- Strong adhesion – Minimize bond-line failure that would allow moisture to penetrate to the substrate and initiate the corrosion process
- Low viscosity to penetrate and seal structural joints for better corrosion protection
- Thin film resulting in reduced dry weight
- Fast curing time – Less idle time within the workflow
- Functional under extreme temperatures from -60°F to 400°F (-51°C to 204°C)
- Non-VOC and non-biocidal – Minimal personal protective equipment required for personnel
- Non-hazardous – No restrictions for transportation and storage
- Solvent removable
- Baseline NPL is transparent; tinting is optional for visual identification purposes

General Application of APW100 Series:

NPL technology is the next generation of corrosion protection developed to replace current organic-based corrosion inhibiting compounds. Apply NPL to protect metallic airframe structures and components against corrosion damage. NPL may also be used to protect areas against erosion damage. NPL is a two-part mixture with a pot life of 72 hours.

With low viscosity, the NPL can be easily applied by spray application with an effective thickness of less than 1 mil (0.025 mm). At room temperature, the NPL is cured under one hour for less workflow interruption. With zero VOC, workflow in confined space can progress during the application process without stoppage to increase productivity.

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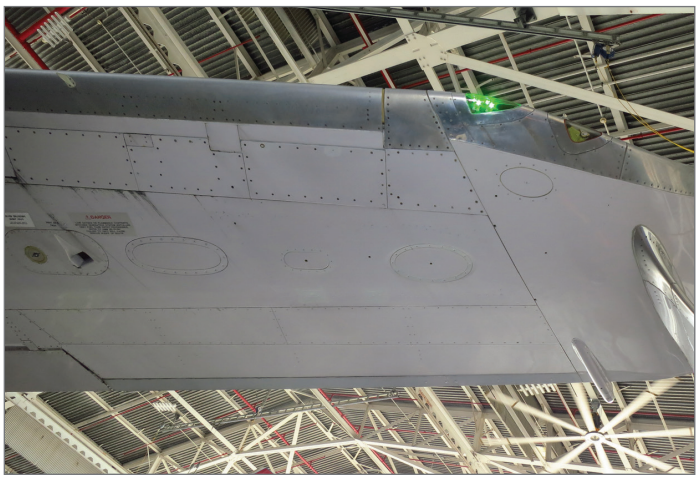
Proven Concept:

The NPL technology has been thoroughly tested in the laboratory environment and evaluated by several US commercial airline operators. On-aircraft evaluation was conducted in the salty, hot, and humid environment around the Pacific islands including Hawaii and Guam. The NPL technology proved significant improvement over traditional organic-based protection and bare metal surfaces protected by chemical conversion coating.

In the on-aircraft evaluation, selected external areas susceptible to corrosion damage were applied with the NPL as a top coat. In the Pacific island region where these aircraft operate, repeated corrosion damage of these areas was the norm and within a short interval as low as 60-90 days. With the NPL applied, these areas were corrosion-free for the 10+ month monitoring period and left in-place thereafter for an additional 12 months of protection. Specifically these areas included the outer wing lower skin panels on the 737NG, and the leading edge cap of the horizontal stabilizers on the 717-200. The NPL technology was able to protect these areas above and beyond traditional methods.



Outer wing lower skin evaluated with NPL

Horizontal stabilizer leading edge cap evaluated with NPL

AeroPel™
NANOCOMPOSITE PROTECTIVE LAYER

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