

PETER/LACKE

Reducing aircraft weight through innovative two-layer coating system

PETER/LACKE has a long history dating back to 1906 and is a leading coatings supplier in the Automotive Interior OEM market. In 2023, we strategically expanded into aviation cabin interior coatings, driven by our commitment to sustainability and lightweight innovations.

In collaboration with a Tier 1 cabin equipment manufacturer, we initiated the development of an ultra-lightweight coating system to reduce cabin weight in long-range aircraft. The project aimed to support airlines in lowering fuel consumption, reducing CO₂ emissions, and increasing operational efficiency—all critical factors in the push for greener aviation.

SUSTAINABILITY GOAL

Our primary objective was to reduce the weight of aircraft cabin coatings while maintaining durability and safety compliance. By innovating a two-layer coating system, we aimed to replace traditional, multi-layer coatings with a lighter, more efficient alternative, significantly cutting down the number of work steps, material use, VOC emissions, and in the end also the airline's kerosine consumption.

INNOVATIONS

To achieve this, we developed the 2PL² - Two Layer Ultra-Light Coating System, which introduces several key advancements:

1. Ultra-Lightweight Composition

- ▶ Over 60% weight reduction compared to legacy coatings.
- ▶ The system's overall dry film thickness reduced by 50%, from ~130µm to ~60µm.
- ▶ Our innovative ultra-low-density putty is buoyant. Combined with our low-density topcoat, the total system achieves a 30% reduction in material density compared to existing legacy systems.

2. Simplified Application Process

- ▶ Self-texturing capability eliminates the need for separate texture layers.
- ▶ Two-layer system (putty + topcoat) replaces traditional systems (primer/filler + putty + topcoat).
- ▶ Automation-friendly, supporting robotic and automated application of both putty and topcoat.

3. Cost & Time Efficiency

- ▶ Over 50% reduction in material consumption due to elimination of intermediate layers.
- ▶ Faster application with fewer manual steps, leading to shorter production cycles.

4. Environmental & Health Benefits

- ▶ Styrene-free with next-generation flame retardants that are antimony- and halogen-free, reducing exposure to substances flagged under REACH and other regulatory frameworks.
- ▶ Waterborne topcoat with low VOC emissions and a bio-based hardener, minimizing the environmental impact.
- ▶ Localized production across 9 strategically placed sites, reducing freight emissions and supporting regional supply chains.

CHALLENGES

During development, several key challenges arose:

1. Balancing weight reduction with durability and fire resistance

Traditional coatings rely on particular (hazardous) materials to meet fire safety standards. By working closely with suppliers and material scientists and leveraging cutting-edge technology, we engineered a high-performance formulation that meets aviation's stringent requirements while significantly reducing weight.

2. Convincing stakeholders to adopt a new system

Airlines, OEMs, and MROs are often reluctant to transition from long-established, qualified and/or approved products, many of which are based on 20+ year-old technology. To address this, we partnered with a Tier 1 customer to conduct extensive testing and data validation, demonstrating cost savings, performance benefits, and full regulatory compliance.

WE ARE CHALLENGING THE STATUS QUO WITH A NEW ERA OF AIRCRAFT INTERIOR COATINGS THAT REDEFINE PERFORMANCE AND SUSTAINABILITY



TANGIBLE IMPACT

1. Up to 100 kg weight reduction per aircraft based on Tier 1 manufacturer calculations. This leads to significant annual kerosine saving also reducing CO₂ emissions.
2. Safer working environment with fewer hazardous materials, improving (future) compliance with occupational safety standards.
3. Faster application time, reducing overall cabin manufacturing and maintenance downtime.

By combining cutting-edge ultra-lightweight raw materials, sustainable chemistry, and innovative application methods, PETER/LACKE's 2PL² - Two Layer Ultra-Light Coating System sets a new standard for eco-efficient aircraft interiors. This innovation not only reduces environmental impact but also delivers practical, measurable benefits to airlines and manufacturers striving for a greener future.

