

## Reliability-Based Fleet Management: Measuring Decisions in a Complex World

### *Introduction: Blending Art and Science*

The StandardAero commitment to excellence, measured by new processes and techniques that add value to MRO activities, extends to every facet of the maintenance process. This includes aircraft painting, which is an essential element of fully integrated capabilities at major facilities in the U.S., Canada, Europe, Australia and Singapore, as well as 14 other service and support centers around the world. The company's strong annual revenue base, exceeding \$1.4 billion, enables StandardAero to bring extensive resources to every maintenance task, including painting, that keeps aircraft ready for reliable service while minimizing overhaul turn-around times.

### *The Problem: Overlooking Paint Can Hide Serious Problems*

Although some may not consider paint an essential maintenance issue, it provides significant protection for aircraft structures. Paint acts like an exterior shell that prevents harmful airborne particles and moisture from initiating corrosive damage that can weaken critical airframe components. Several factors compound the problem, leading some fleet managers to delay or avoid paint-related maintenance tasks. An existing coat of paint may look deceptively good even when renewal is long past due. Even if paint appears worn, aircraft owners may put off refinishing when other large-scale maintenance or overhaul tasks compete for attention and budget. Furthermore, achieving exceptional paint quality is no less demanding than any other maintenance activity. An expert paint job involves extensive preparation including stripping, cleaning and priming, meticulous attention to detail and multiple inspections to ensure proper completion. For these reasons, fleet managers may push fuselage and component repainting toward the bottom of their "to do" lists, although many maintenance authorities argue that aircraft should undergo repainting as frequently as every six years. Unfortunately, delaying paint or taking shortcuts to save time can create far more serious corrosion issues that may require far more extensive – and expensive – solutions to repair structural damage.



## How StandardAero Adds Value Through Aircraft Painting

### *The Solution: StandardAero Painting for Protection and Value*

StandardAero operates its comprehensive aircraft paint facility in Springfield, Ill., a location selected for its convenience to most commercial fleet operations in the U.S. The 62,000-square-foot facility is co-located with one of the company's business aircraft maintenance operations, as well as an aircraft completion center, so aircraft painting can be integral to major maintenance and involve a simple 100-foot tow from maintenance facilities to the paint hangar. Co-location reduces labor costs because aircraft reassembly after maintenance completion, required when a plane must fly to a stand-alone paint facility, is not necessary. Furthermore, if painters discover structural flaws, airframe technicians are readily available to complete repairs on site, avoiding further process delays. By working on several major maintenance tasks – including repainting – simultaneously, fleet managers can minimize downtime, frequently completing complex and demanding schedules within the same timeframes normally required for airframe and power plant inspections and overhauls. Because major overhaul schedules mesh well with recommended repainting intervals, painting – usually completed in 30-day cycles, depending on the paint scheme requested – can be efficient and economical, adding overall performance value to individual aircraft and fleets.

Proper removal and reinstallation and balancing of flight controls and parts and full inspection of these components to find possible corrosion or damage also are important steps.

StandardAero's painting experts bring an average of 20 years' experience to the job, with full qualifications to apply conventional paint, high-solid coatings and Teflon. The Springfield facility contains a downdraft booth large enough to accommodate most large business jets like CRJ900, Global Express XRS, Gulfstream V and Embraer Lineage. The state of the art booth draws filtered air downward to help capture and contain overspray more effectively than conventional cross-ventilation systems. Other advanced filtration capabilities and chemical disposal processes comply with rigorous environmental standards, ensuring that airborne particulates do not affect paint coatings and preventing effluents from polluting the outside atmosphere. StandardAero can provide the most advanced coating materials or apply the paint that a customer prefers. Regardless of the product utilized, painting staff will make sure that it is prepared, mixed in correct proportions, agitated and applied correctly to manufacturer's specifications. Lack of attention to these details can produce uneven coverage, fish eyes in the paint coating and other imperfections.

Painting experts also understand that a high-quality job involves more than just deft handling of a spray gun. Aircraft maintenance manuals specify coating types for movable components, including flight

control surfaces and thickness requirements for various fuselage areas. Attention and care devoted to surface preparation increases the coating's protection level and lengthens its useful life. Masking is also important to protect composite components from stripping chemicals and to avoid crazing on windows and windscreens, contamination of actuators and other moving parts



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including engines and damage to sealed seams. Extensive hand sanding and acid etching make surfaces smooth and clean, ready for applications of corrosion protection, primer, more sanding and three or more coats of paint. Proper removal and reinstallation and balancing of flight controls and parts and full inspection of these components to find possible corrosion or damage also are important steps. This process expertise is often not available at aircraft painting facilities, but it is a StandardAero specialty. Nearly two dozen technicians working through two shifts keep the entire process moving efficiently. After painting, the aircraft cures in the facility's computerized temperature- and humidity-controlled downdraft bay. Curing in high heat takes a full day, followed by overnight cool-down. The facility's computer-controlled environment ensures optimal adherence during curing, regardless of outside weather conditions.

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Decorative and detail painting – stripes or other designs that comply with FAA regulations, registration numbers and coatings for flight control surfaces and other moving parts – follow. StandardAero will apply Teflon coatings to moveable surfaces including wing leading edges and flight controls for improved wear.

StandardAero's design staff uses computer modeling to create unique and interesting paint details that distinguish aircraft. With computer modeling capabilities, a fleet manager's design and color options are practically infinite.

### ***Painting Provides Maintenance Benefits***

StandardAero's insistence on process quality in all maintenance operations ensures that customers will enjoy similar benefits from the company's painting activities. Expert knowledge of advanced coatings, full qualifications to prepare and apply finishes on a variety of surfaces and complete understanding of paint effects on moving parts, control surfaces and static structural elements will ensure optimal airframe protection and longer coating life. Use of Teflon paint, high-solid coatings and other materials also extends structural protection.

Company experts work closely with customers through every step of the paint process to ensure that all aircraft in the facility receive the materials and undergo the right tasks to make sure new paint adds genuine value. After maintenance and painting processes are completed, StandardAero also provides continuing advice to optimize system performance. For example, the company's paint experts advise customers not to buff aircraft because even mild abrasion breaks open the top layers of paint pigment, facilitating absorption of a wide variety of contaminants that ultimately destroy the surface sheen of newly applied paint.

StandardAero stands behind paint services with a workmanship and materials warranty for three (3) years after the date of Redelivery for the Paint specifications.

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### *Customers: Not Just a Pretty Fuselage*

StandardAero's emphasis on high quality and quick turn-around has demonstrated that proper attention to aircraft coatings and finishes can enhance aircraft efficiency and reliability. Interesting aircraft exteriors impress passengers and may lead to additional business. Also, taking full advantage of scheduled paint and finish maintenance helps to ensure that aircraft structures will not face corrosion problems or other issues that may lead to major repair downtime and cost. Process expertise also ensures full value from repainting by optimizing coating life cycles and avoiding unnecessary repairs.

Whether the maintenance task involves fuselage repainting or major engine overhauls, StandardAero's goal is the same: helping fleet operators improve reliability and safety while containing costs to create a competitive advantage in the global aerospace market.

