

Commercial Aerospace Process & Equipment Survey

Background:

The commercial aerospace industry includes airlines, air freight companies, OEMs, and contract maintenance operations facing the same legislated requirements as the USAF to reduce pollutants generated by aircraft refinishing operations. The advent of the National Emission Standard for Hazardous Air Pollutants (NESHAP), and other environmentally driven requirements for reduction of all pollutants, has compelled the commercial aerospace industry to change all aspects of aircraft surface processing associated with repainting. These include cleaning, de-painting, corrosion protection, coating systems, and the application and process equipment. Commercial operations must consider all aspects when selecting a process including facility, implementation, operational, and airframe life cycle. This project was conducted to review and analyze data and information on current and future commercially viable processes for potential integration into the USAF airframe repainting operation.

Project Sponsor/Customer: Air Force wide

Period of Performance: Sep 96 - Apr 98

Objective:

This project observed operations at commercial painting facilities and documented the procedures, materials, and equipment used to produce top quality finishes under production conditions. The goal was to recommend commercial procedures, materials, and equipment that could be utilized by the USAF to improve painting quality while reducing hazardous chemical emissions.

Status:

The first project task was to identify commercial sites of interest to and accessible to CTIO personnel. These sites were identified and site visits were scheduled with the help of representatives from several paint manufacturers. CTIO personnel observed and recorded significant procedures, materials, and equipment used by aerospace companies to paint and repaint commercial and military aircraft. CTIO personnel toured facilities and interviewed employees at each site to document information on their procedures and materials for paint application. These procedures and materials were

evaluated to determine those providing the USAF with the most improvement in painting quality and to the best potential to reduce hazardous chemical emissions.

The following sites were visited:

- Cessna Corporation, Wichita, KS – manufacturer of single engine turboprop planes and business jets
- Cessna Corporation, Independence KS – manufacturer of small, propeller aircraft
- Dee Howard Corporation, San Antonio, TX – aircraft maintenance/repainting company for large commercial aircraft
- Delta Airlines, Atlanta, GA – repainting facility for large commercial aircraft
- Gulfstream Corporation, Savannah, GA – manufacturer of business jets
- Learjet Inc., Wichita, KS – manufacturer of business jets
- McDonnell Douglas Corporation, St. Louis, MO - military aircraft manufacturing facility
- Pride Aviation Inc., New Iberia LA - repainting company for large commercial aircraft
- Raytheon Aerospace, Waco, TX – aircraft maintenance/repainting company for commercial and military aircraft

The report recommends the AF review the following principal materials, procedures, and equipment for further exploration and implementation:

Environmentally Acceptable (EA) Chemical Stripping. All survey sites were using (or in the process of converting to) types of environmentally acceptable (EA) chemical stripping. No sites used dry media for stripping major surfaces of aircraft due to the high capital equipment cost.

Electrostatic Spray Application Equipment. Commercial sites typically use electrostatic spray application equipment. Three sites were using the Graco 3500 or 4500 type guns. They claim to have greatly reduced overspray with good appearance while using high solids topcoats. Other sites also successfully use these guns for production application of waterborne primers.

Waterborne Primers. Waterborne primers were used at several of the sites. CTIO members observed application of waterborne primers from Deft. The sites use special

chillers for keeping the paint reservoirs cool; the lines and guns are kept cool inside these chillers during short work breaks. Supplementary cool storage is also used for both the dilution water and the unmixed components to prolong the shelf life and the pot life. One site reported improved surface finish with the waterborne primer, which allows them to eliminate a sanding step before topcoat application.

Primer/topcoat System. The commercial sites reported that under no circumstances would they mix systems from different vendors. Their experience is a paint finish quality can only be ensured when a primer/topcoat system is applied per the manufacturer's requirements/specifications.

Project Plan: Dated Aug 97

Final Report: Titled: "Commercial Aerospace Process and Equipment Survey"

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