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Getting snappy liveries

How can airlines save money with effective preventive maintenance of the airframe? Henry Canaday reports on the paints and coatings being used to meet the challenge.

Aircraft livery is the most visible branding device an airline has. It’s no accident that Southwest Airlines, which spends not a dime unnecessarily, has spiffier-looking planes than the bland white with a few embellishments of competitors like United and Delta. Looking good at the gate and on runways is smart marketing.

Moreover, getting and keeping those bright images is becoming easier. Paint suppliers have come up with better materials and systems for painting fast and durably. And paint shops have refined their methods for getting good results economically.

Mankiewicz currently offers three kinds of aircraft paints, explains the company’s director of aviation, Andreas Ossenkopf. It manufactures anti-corrosion paints for structural parts, interior cabin paints, and paints and coatings for external use on airframes.

The company started out 40 years ago with cabin paints, and Ossenkopf says this is the area that has seen the most recent changes. These are the paints that cover plastic parts in galleys, toilets, seats, panels and other interior components.

Airlines are now looking for more distinctive interior effects to emphasise their brand, especially in business class. But paints must still meet stiff requirements for resisting fire, smoke and toxicity. So Mankiewicz has its own in-house designers who can work directly with airline designers to translate pleasing designs into technical requirements.

Another change has been interest in antimicrobial paints, especially for lavatories and galleys, to discourage microbe growth. But customers, especially the aircraft OEMs, still want paints that can be applied quickly to minimise downtime, avoid any imperfections that sensitive passengers may notice and have low density to minimise weight, which is always a key consideration on aircraft.

For fuselage exteriors, Mankiewicz developed the Base Coat–Clear Coat (BCCC) system to break into a very competitive market. BCCC serves the interests of OEMs, paint shops and airlines, Ossenkopf argues. It reduces painting times for anything but the simplest, one-colour liveries. The base coat takes only two to three hours to dry, versus eight to 12 hours for traditional top coats.

BCCC requires only one layer of paint to hide previous coatings effectively, rather than requiring two layers as was sometimes necessary before. And for airlines, BCCC lasts eight to 10 years, as opposed to about five years for the old single-stage system. That means less frequent repaints, or at least better-looking liveries for much longer. Ossenkopf predicts that these advantages will lead to 80%-90% of aircraft painting being done using the BCCC method 10 years from now.

For the future, the Mankiewicz exec sees a shift to more automated aircraft painting. Instead of workers taping and spraying, Ossenkopf believes robots and printing technologies will come into use. Airbus ➔
MAAS Aviation has been busy lately painting new aircraft for Airbus, including the first aircraft assembled at the OEM's US plant.

has begun automation by printing designs on vertical stabilisers, and much more is possible. Ossenkopf foresees automation of the application of both base coat and clear coat. This may encourage the development of new paints suited for automation and even faster drying.

Other changes are coming as European regulators apply pressure to reduce chromates in paints, remove solvents and move toward water-based paints. Generally, aircraft paints are changing much more rapidly now than they used to, and Ossenkopf says his company will continue to invest in research to innovate the best painting options.

PPG's Desothane top coats have been a standard in aircraft painting for many years, and its Desoprime primer is used in many applications, says Mark Cancilla, director for aerospace coatings. PPG's newest top coat, Desothane BCCC, has painted 400 aircraft in five years and is set to paint a thousand more. Desoprime chrome-free primer has been applied to more than 2,000 aircraft.

PPG's Deft product line includes structural primers, water-reducible primers, chrome-free primers, advanced top coats and new chrome-free pre-treatment products. Cancilla says Deft products enable PPG to address nearly any customer need.

The company also supplies coatings for fuel tanks, wings, walkways and moveable aircraft parts. It has a growing list of cabin coatings, temporary protective coatings, paint removers and paint-maintenance chemicals.

PPG recently launched Aerocron electrocoat primers, claiming a first in aviation. And its Solar Heat Management coating based on Desothane chemistry reduces surface temperatures, very useful for composites with temperature limitations. This coating also reduces cabin heat, saving cooling costs on the ground.

The firm's top coats offer many colours, as well as featuring its Andaro special effects. Cancilla says better paint systems and appearances have opened a wider design envelope for aircraft liveries. Once mostly white with dabs of colour, aircraft are now painted in a wide variety of colours and use effects like mica. Robust applications and repairs have made using full colour palettes economical.

PPG continues to focus on key value drivers such as saving weight, efficient application, durability, as well as reducing environmental and health impacts. For example, its Aerocron primer significantly reduces weight by using dip coating with precise control over film thickness, unlike spray application processes. Aerocron has strong resistance to corrosion while using non-chrome inhibitors and is designed for the life of the aircraft.

**CONSISTENT FINISH**

Desothane BCCC goes on more quickly than standard gloss paint, uses less material to hide old surfaces and dries faster. And less paint means less weight. Cancilla adds that Desothane's robust application yields consistently good appearance, meaning less reworking is required.

Sherwin-Williams has just introduced two new painting products, notes Julie Voisin, global product manager of aerospace coatings. “In the past we offered products that could apply to any size of aircraft,” Voisin explains. “Now we are customising products to suit particular segments of the market.”

One new Sherwin-Williams offering is JCX, a single-stage painting system that is designed especially for commercial aircraft. JCX is simple to mix, and it dries quickly. “It comes in a kit,” Voisin explains. “You dump the components together and then spray it on.” As a result, it’s a fast, convenient solution for regional, narrowbody or widebody aircraft.

Speed is achieved partly by simplicity. JCX has only three component liquids, versus four to five components for traditional systems. And the new product also dries about 25% faster than traditional aircraft paint.

Sherwin-Williams continues to offer both single-stage and BCCC systems. Voisin says single-stage could be preferable for a simple livery – for instance, a design with one colour and a few stripes or decorations. BCCC is better for a more complex livery, with five to eight colours, she notes.

Sherwin-Williams’ SKYscapes paint, a BCCC system, has now been qualified by Embraer for both commercial and business jets. The company has been making SKYscapes for about six years, but has upgraded it to meet the OEM’s stringent requirements, especially for resistance to the tough chemicals and fluids that wash over aircraft exteriors. Voisin says this qualification, while not mandated, is often very important to some customers.

As a BCCC paint, SKYscapes will probably last longer. That does not necessarily mean less frequent repainting, as that tends to be done according to heavy maintenance schedules. But Voisin says BCCC paints can retain their attractive new look longer throughout their life, strengthening an airline’s brand image.

Sherwin-Williams has also developed a new BCCC version of SKYscapes targeted
especially at the business and general aviation market. The new paint dries to touch in 60 to 90 minutes and offers some interesting new effects like mica, metallic finishes and pearl. “Commercial aircraft might use it for special effects on top of their paint – for example, on the tail,” Voisin observes. And these arresting special effects could be applied very quickly.

The Sherwin-Williams manager says her company is famous for its paint’s appearance. “We do colour very well, and that is certainly important for any airline’s brand,” she declares.

Oerlikon Metco offers a wide range of surface solutions, including coatings that can be used on aircraft. Its thick-film coatings (about 6 mm) are used to protect turbines and other interior parts from wear. The company also makes thin-film coatings (about 1 mm) for aesthetic treatment of aircraft cabin parts, explains Richard Weiler, manager of Oerlikon’s aero segment. For example, it offers a black oxide coating for knobs and other interior accessories to make them look better. There is also a titanium nitride coating that protects cabin parts from wear.

Painting is carried out at several UK facilities: Norwich, with capacity up to Boeing 757-300s; London Southend Airport, with capacity up to 737-700s; East Midlands Airport, with capacity up to Airbus A321s; Manchester Airport, with capacity up to A350 XWBs and 747-8s; and a new widebody facility at Cambridge. There is also a facility in Bratislava, Slovakia, with capability up to A321s. “Full engineering support can be provided by our maintenance partners alongside our locations,” Jarman notes.

Another Mankiewicz production for Brussels Airlines, this time in support of Belgium’s football team, nicknamed The Red Devils.

For nearly a quarter of a century, Air Livery has been painting aircraft with high standards of workmanship and cost-effective solutions, says sales manager Tracy Jarman.

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In addition to its own paint shops, Air Livery now owns ATE Industries shops in Chateauroux and Toulouse. ATE staff have been painting aircraft for Airbus, ATR and other customers for many years, and the French company gives Air Livery two more widebody bays and one more narrowbody bay.

Customers include Air Atlanta, Norwegian, Air Berlin, Jet2, Virgin Atlantic, CityJet and many others. Air Livery has done large-scale programmes in short timeframes for airlines such as Thomas Cook, easyJet and British Airways franchisees. It also partners with MROs like ATC, Sogerma and ADAT to provide additional painting capacity.

The company has been audited by major firms such as SR Technics, EADS, Singapore Technologies and Monarch Aircraft Engineering.

Air Livery now has over 170 employees throughout Europe, and the company is committed to strengthening its position in the European market. It has worked for customers in the Middle East, Africa, Russia, the CIS and India. Air Livery can use both high-solids and BCCC painting methods.

C&L Aviation Group paints mainline and regional aircraft, as well as corporate and VIP types, explains paint shop manager Paul Moore.

“Beyond painting, we offer sand- and chemical-stripping capabilities, corrosion control, composite repair, metal polishing and registration changes,” Moore says.

The company has experience with all major coating systems. And it can also remove, balance and reinstall flight controls, ensuring proper weights and balances after painting is completed. In addition, C&L offers painted placarding to increase longevity, finish and detail work and logo design.

COMPREHENSIVE CAPABILITIES

The company operates in a state-of-the-art 20,000 sq ft painting hangar in Bangor, Maine, USA. The hangar can accommodate multiple regional jets using a three-zone airflow system. Moore says C&L is distinguished by its one-stop approach. “We offer all our services – maintenance, interiors, painting, part supply – at one facility, saving customers time and money.” With a modern facility, the firm plans to stay current with the newest industry techniques.

MAAS Aviation has extensive experience in painting new jets from Airbus and in repainting a variety of aircraft from other manufacturers. The firm is increasing its capacity, both in its traditional European facilities and in its new US location, in Mobile, Alabama, explains Fran Carew, director of sales.

MAAS has just painted two Airbus A321s for JetBlue Airways and American Airlines in Alabama, where it completes new jets for Airbus’s US factory. In January 2017, it will open a twin-bay shop for repainting any narrowbody aircraft, also in Mobile, near VT Mobile Aerospace Engineering’s overhaul facilities.

The company has been painting new Airbus narrowbodies in Hamburg since 2012. It has painted a variety of aircraft in Maastricht since 1989 and has operated another paint shop at Fokker Services in Woensdrecht. Maastricht will get another single-bay hangar in the first quarter of 2017. Carew says his firm can handle up to Boeing 767s in Maastricht, but specialises in narrowbody jets.

The MAAS sales chief credits its successful growth to “a 30-year history, a reputation for quality and our association with Airbus”. MAAS also employs a permanent docking system for painting aircraft, which minimises damage risks from moving cranes or other equipment.

The company can use the traditional high-solids paint system or BCCC and paint from any manufacturer, at the customer’s discretion. Carew says he sees continuing momentum toward BCCC and also increasing demand for chromate-free primers.

Meeting customers’ aircraft painting requirements, it seems, is quite an art in itself.