CORROSION VI

By Dennis Wolter

For those of you who own older and/or corroded airplanes, I'm sure there were times in the clean up process that you thought you would never get the cabin, belly and other areas of your airplane clean. With that part of the project completed, step back and admire your work. Take pride in knowing that you have most likely saved your airplane from an untimely end. Grab your camera and take some shots of that shiny bright cabin, and be sure to make some good resolution prints and put them with your aircrafts records. These images will be very valuable at resale time. Also, should the FAA ever insist on more in-depth inspections and clean up in the future, you have proof of the clean condition of your airframe.

Thoroughly cleaned cabin ready for final solvent wipe down

One final check, get out a flashlight and inspection mirror and take a close look up under stringers on the top sides of structural components on the back sides of floorboards, and everywhere in the belly. You'll be surprised at what you may have missed. Here at Air Mod, we ask a technician who was not involved in the cleaning up process of a given project to be the final clean up inspector; it's amazing what a fresh set of eyes can do. It is not uncommon for the nitpicker to spend half a day cleaning up what they find.

Using a bright flash light and an inspection mirror for the inspection in all the hard to see places

So now it's time for the final step in the corrosion management process, the actual application of zinc chromate or zinc phosphate. Properly applied, either of these coatings will do two things to help stop corrosion. First, being a moisture tight coating, it physically inhibits any corrosion-causing moisture-born electrolytes from coming in contact with the aluminum. Second, the chromate or phosphate is a dielectric material that stops the flow of electrons. These coatings eliminate two of the three elements that are known to cause corrosion.

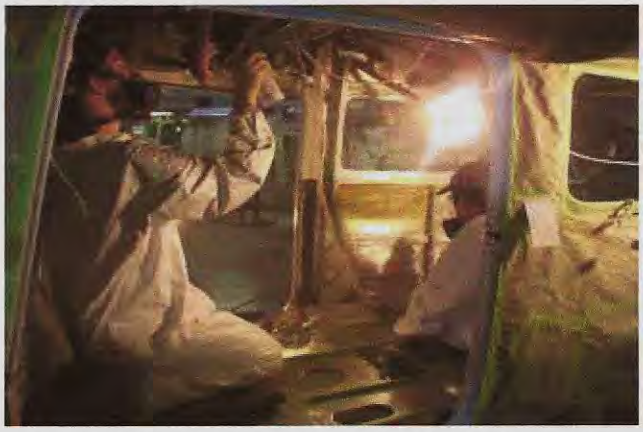
Begin this process by doing a final pre-spraying wipe down. Pour about a quart of new lacquer thinner into a pan and use a clean, soft rag to wipe down every square inch of the soon to be green or yellow aluminum. As you proceed through this part of the job, constantly flush out the rag in the pan of the lacquer thinner. Don't hesitate to properly discard the contaminated lacquer thinner and add a fresh supply. Absolute cleanliness is the key to good adhesion of the chromate or phosphate.

Tyvek suit, hat, goggles, rubber gloves, thinner pan, rag and chromate

I'm sure by now you are wondering which coating is best, chromate or phosphate. Not being a chemist, I can't delve into the specific properties of either product. We initially used only zinc chromate, available from Aircraft Spruce. Due to health concerns, we started applying zinc phosphate (also available from Aircraft Spruce). Both are mil-spec rated and are widely accepted throughout the industry; the choice is yours. Whatever you do, be sure to follow all safety precautions as outlined on the product specification sheets available from the manufacturers.

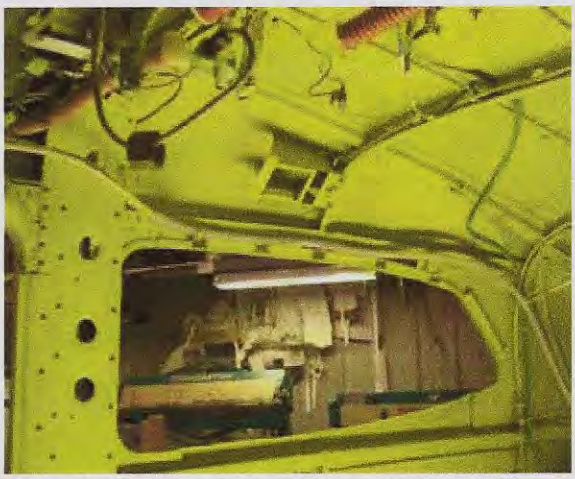
Back to work. Set up an evacuation fan in a door or window with two layers of good filtering material mounted to the intake sides of the fan. Then set up three or four floor fans, one to blow through the cabin or the wing or whatever section of the airframe you are about to spray. Use the other two or three fans to direct the overspray towards your big filter-protected evacuation fan. An adequate evacuation method is absolutely necessary. If you don't have access to a one- or two-horsepower exhaust fan, one can be rented from a tool rental company.

With all of your protective gear on and the fans running it's time to begin spraying. Grab a good explosion proof flashlight or drop light and begin spraying the hard places first, such as the under sides of the stringers and behind bulkheads. When the spray cans are new they'll spray up and under difficult to see surfaces. When the can is half empty put it aside and start a new one. Once all the tedious parts are covered, finish using the half empty cans, which will spray nicely when held upright, to spray the vertical and easy to get to places. I recommend that you first apply a light dust coat followed by a smooth flow coat. If some places look a little thin don't worry, these coatings are almost translucent and can have a mottled look even though the aluminum is thoroughly coated. Be careful not to apply so much material that it creates runs; less is more in this game. Don't forget to clean and spray both sides of removable inspection panels and any other separate airframe components.



Hours of cleaning and only one half hour of spraying

When the airframe is completely coated, allow two or three days at approximately 70°F for a good cure of the material (if the chromate or phosphate is not thoroughly dry, Corrosion X or ACF50 will cause the uncured chromate or phosphate to remain sticky for a very long time). Speaking of temperature, be sure to follow the temperature and humidity parameters indicated in the product specification sheets. Operating outside these limits will definitely degrade the effectiveness and durability of these coatings.



Completely chromated and de-masked 210 cabin

Once things have cured, it's time to treat the belly area below the floors with a good fogging using ACF50 or Corrosion X. We buy spray cans of either product and, as we spray it through a floor inspection panel, we use a high pressure hose with the nozzle of the hose almost touching the outlet point of the spray can nozzle. The high pressure air intercepting the low pressure fluid as it leaves the spray can nozzle really atomizes the fluid into a very fine fogging mist that permeates all of the impossible to reach surfaces below the floors – it works great. A small touch-up gun sprayed at high pressure will also do a good fogging job below the floors or in difficult to reach areas. Again, wear safety equipment to thoroughly protect yourself. Be sure to brush or spray Corrosion X or ACF50 on any complex and critical structural components, such as front and rear wing attach points, lower and upper spar attach points, and landing gear saddles and boxes. I want to stress again that you need to allow two or three days for the chromate or phosphate to thoroughly dry before the application of any fogging materials.

Air nozzle and spray can fogging technique works great!

I think we're at a good stopping point. Next month we will move on to some fine points and often overlooked details involved in cleaning and completely fogging your airframe. Messy but important stuff. Until then, fly safe!

AIR MOD is a full service aircraft renovation company in southwest Ohio offering a wide range of comprehensive services: innovative aircraft interiors, custom instrument panels, auxiliary fuel systems, glass installations and other modifications. The company was founded in 1973 by Dennis Wolter, industrial designer by vocation and aviation enthusiast by avocation.

Please give them a call at 513.732.6688 if you would like additional information or wish to visit the facility. You can also contact them at www.info@airmod.com