FOCUS: Finishing for Aerospace Applications



Expanding Plating & Chemical Processing Capabilities Spells Success for FAA Repair Station

Able Engineering and Component Services is an FAA repair station that provides products and services for both helicopter and fixed-wing aircraft operations. Many of the products and services the company provides to those customers require one or more chemical processes to complete the job. To have better control over quality and service, Able has always endeavored to bring as many of those processes in house as possible.

Able Engineering's production facility is located in a 50,000 ft² building in Scottsdale, AZ. The company also has offices in Florida to better focus on supporting its international base of customers.

Turnaround Time is Everything

It isn't unusual for a particular job to require three or more coating processes before completion. Every time a part is sent out of house for an operation, it is not unusual to lose two days in shipping alone. Able's inhouse processing allows them to accomplish in 24 hours what would normally take one to two weeks at other FAA repair stations.

Processing Capabilities

The latest additions to the Arizona facility's processing capabilities include high-speed and conventional hard chrome plating, nickel plating, phosphate coating and cadmium plating. All four of these process lines were custom designed by Universal Engineering Systems in Chandler, AZ. These processes are commonly used in conjunction with repair and overhauls provided to aircraft operators. Other processes at the facility include:

1. Brush plating

2. Anodizing

- 3. Sulfamate nickel
- 4. Gold plating
- 5. Chemical film
- 6. MIL-SPEC painting
- 7. Structural bonding
- 8. Florescent penetrant inspection
- 9. Magnetic particle inspection
- 10. Machining & grinding
- 11. Hydraulic testing
- 12. Various non-destructive testing & inspections
- 13. Ultrasonic cleaning

Latest Processing Additions

Design of processing lines for engineering and repair applications can be a difficult task. By working closely with Universal Engineering Systems' president, Douglas Bromley, design-to-installation of the new processing lines and waste treatment equipment at Able went precisely as planned.

The first consideration was environmental compliance. The flooring



include cadmium and nickel plating, phosphate coating and painting.

in the new processing area consists of a quarter-inchthick polypropylene liner over an epoxy-coated floor and concrete berm. All of the non-rinse tanks sit in stainless steel, double-containment tanks to prevent spilling of hazardous chemicals in the event of a fire or heating element failure.

The second consideration was to maintain Able's status as a zero sanitary sewer discharge facility. To do this, two large collection tanks and a gas-fired evaporation system were added to process the additional wastewater. The wastewater is primarily generated from process

rinsing and fume scrubbing. DI water nozzles were installed above the processing tanks to pre-rinse components prior to going into final rinse tanks. This substantially cut the amount of rinsewater required. All concentrated waste material is hauled away and recycled by an **EPA-approved** source.

To handle the fumes from the hard chrome plating line, a scrubbing system was selected that complied with the strictest air quality standards. To further improve the efficiency of the new scrubbing system, in-line

mist eliminators were also installed.

Processing Applications

The "centerpiece" in Able's expanded processing area is hard chrome plating. There are thousands of existing aircraft applications for hard chrome plating as a repair process. As with repair and overhaul of any commercial aircraft component or assembly, each application must be handled in accordance with procedures approved by the governing airworthiness authority, such as the FAA. In cases where hard chrome plating is a good candidate for repairing a component, but approved procedures do not exist, the company's engineering department (consisting of 11 engineers) works closely with the manufacturer of the component and the FAA to generate approved data. Annually, Able saves aircraft operators millions of dollars by generating approved repair procedures, thereby saving otherwise scrap parts. When using hard chrome as part of a repair process, the thickness requirements can range from .001-in. to .050-in. Selecting the right plating chemistry and tooling design is paramount to success for these demanding applications.

Cadmium plating was added to coat non-chrome-plated areas for corrosion protection. Able had always used



brush plating in the past to cadmium-plate components, but with continually seeing higher volumes and larger parts, the company found that tank processing speeds up the work and reduces the cost to its customers. Before plating hard chrome and cadmium on stainless steel alloys, a nickel strike is plated on the part to ensure proper adhesion.

Phosphate coating was added to prevent losing jobs because of turnaround time. Able doesn't actively pursue jobshop work

for individual processes. More than 90 percent of the work performed involves complete repairs or overhauls. In the case of phosphate coating, it is a very small part of the repair or overhaul, but not having the capability in-house could lose the company thousands of dollars in work as a result of poor turnaround times. This is just one example of Able's commitment to continually improve the service provided to its customers.

Employees Make the Difference

The management team works very hard to get all of its employees involved in improving the quality and service provided to its customers, as well as improving the work environment. As an incentive for employees to participate in these efforts, Able gives a substantial percentage of net profits back to all employees proportionate to their incomes on a monthly basis. Every dollar saved through efficiency or cutting out waste gives Able employees a return on their investment. The end result is that employees are very cost-conscious when spending company money, because they know they will be rewarded for their efforts.

Management stresses that there are two main categories in every job description: Hard skills and soft skills. The hard skills are associated with what it takes to do the task at handnot just activities, but a strong focus on the desired end result. At Able. they never confuse efforts with results. Soft skills deal with how employees interact with each other and participate in the company's continuous improvement programs. It's not enough for employees to simply focus on the job they are doing-they are charged with helping others around them be more successful as well. This team-oriented philosophy has resulted in a continuing success story for Able Engineering and its employees. PASF

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