

Clemco helps fight the war on corrosion

by Herb Tobben

While most of the articles I submit to The Shot Peener relate to shot peening, surface finishing, and other industrial applications, as a tie-in to other articles in this issue, the editor invited me to talk about Clemco's involvement with corrosion.

Clemco's mission is to develop and market superior corrosion-control and surface-treatment technologies that deliver innovative, high-performance cleaning and finishing solutions to industry worldwide. As corrosion undermines the nation's infrastructure, and has serious safety implications for the world's fleet of aircraft, Clemco takes its role in fighting corrosion very seriously.

Components exposed to the elements eventually sustain damage caused by atmospheric conditions that create corrosion. The severity and the rate depend upon surface-formed electrolytes (moisture), which in turn depend upon levels of atmospheric humidity and pollution. The most common types of corrosion include: general corrosion that is evenly distributed over a surface, galvanic corrosion that results from contact of two dissimilar metals, pitting corrosion that develops in a concentrated area, and crevice corrosion that occurs in small spaces between structural elements (rivets, bolts etc). Crevice corrosion is the most common type of corrosion found on aircraft. It occurs where water is trapped between two surfaces (under loose paint, in the lap joints of aircraft skins, within a delaminated bond-line, or in an unsealed joint). Undetected, untreated corrosion can cause catastrophic structural failure.

More than 50 years ago, Clemco built its business around its first product, a blast machine – a pressure vessel first used for blast cleaning by painting contractors, oil companies, shipyards, and building contractors in construction. These industries adopted abrasive blasting to improve efficiencies when cleaning steel substrates to remove corrosion and prepare these surfaces for coatings.

Through the decades, the uses for abrasive blasting have expanded in part due to an increasingly broad array of blasting media. Blasting began as an unconfined process using whatever media was locally available. The economics of blasting with recyclable media have brought blasting indoors, where the blast process is confined, and where media can be cleaned and reused. Indoor blasting enables the user to trap the dust and debris that result from the process. Small components are blasted in suitably-sized cabinets; larger parts, vehicles, and aircraft are blasted in engineered rooms providing blasting, recovery, recycling and ventilation capabilities.

More than 25 years ago, Clemco's Aerolyte Systems division was created following work Clemco did for the United States Air Force when USAF was looking for coating removal alternatives to toxic chemical strippers for its aircraft. Paint removal is a necessary part of aircraft maintenance to allow surface inspection, to perform repairs, and to keep an aircraft's weight at acceptable levels after several coats of paint have been applied. The unique development began with the employment of plastic grit (the first prototype of the media was made from plastic button holes) as blast media. The medium's characteristics required special process equipment developed by Aerolyte. Since then, Aerolyte has built automated equipment and facilities of all sizes for all types of fixed-wing and rotary aircraft as well as for ground support equipment for the US and many foreign military forces and commercial fleets. Some facilities employ wheat starch media, another lightweight, soft media used on delicate substrates. The military uses plastic or wheat starch or other lightweight media blasting for dry



Aerolyte dry stripping facility for depainting A-10 aircraft at Hill Air Force Base, Utah.

stripping various attack, fighter, trainer, bomber, and transport aircraft as well as for ground fighting vehicles and other support vehicles and equipment.

Blasting with plastic media or other non-aggressive media is an economical and environmentally sound method for depainting. Blasting is done at low pressures (less than 40 psi) to allow coating removal without damaging the aluminum or other delicate substrate. The media is recyclable, 12 to 15 times, until it breaks down too fine to be effective. PMB reduces or completely eliminates the use of chemicals, like MEK, which are toxic to workers and the environment and which create significant waste disposal issues for the users. Facilities include blast machines, media hoppers, floor recovery systems to capture spent media, media cleaners, magnetic and heavy particle separators to remove metal contamination, dust collection for media cleaning and room ventilation, and respiratory protection for the blast operators.

Today, hundreds of government and private facilities fight corrosion everyday with Clemco, Aerolyte, and ZERO equipment. In the United States, blast facilities are in use at Hill AFB, Jacksonville NAS, Pensacola and Cherry Point NADEP, Kaneohe Bay Naval Base, Warner Robins AFB, Tinker AFB, Corpus Christi Army Depot, by Sikorsky Aircraft, American Airlines, and Boeing and by Raytheon in Saudi Arabia, and numerous commercial and foreign military sites in England, Denmark, Spain, Turkey, Egypt, Singapore, and Thailand, among others. ●

For more information about aircraft corrosion, readers can visit www.corrosionsource.com/technicallibrary www.corrosion-doctors.org/Aircraft/Examples.htm#Galvanic www.corrosion-doctors.org



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