

SECTION 11. OTHER METALS AND ALLOYS

6-179. NOBLE METAL COATINGS - CLEANUP AND RESTORATION. Silver, platinum, and gold finishes are used in aircraft assemblies because of their resistance to ordinary surface attack and their improved electrical or heat conductivity. Silver-plated electrodes can be cleaned of brown or black sulfide tarnish, by placing them in contact with a piece of magnesium sheet stock while immersed in a warm water solution of common table salt mixed with baking soda or by using a fine grade abrasive mat or pencil eraser followed by solvent cleaning. If assemblies are involved, careful drying and complete displacement of water is necessary. In general, cleaning of gold or platinum coatings is not recommended in the field.

6-180. COPPER AND COPPER ALLOYS are relatively corrosion resistant, and attack on such components will usually be limited to staining and tarnish. Such change in surface condition is not dangerous and should ordinarily have no effect on the function of the part. However, if it is necessary to remove such staining, a chromic acid solution of 8 to 24 ounces per gallon of water containing a small amount of battery electrolyte (not to exceed 50 drops per gallon) is an effective brightening bath. Staining may also be removed using a fine grade abrasive mat or pencil eraser followed by solvent cleaning.

a. Immerse the stained part in the cold solution. Surfaces can also be treated in place by applying the solution to the stained surface with a small brush.

b. Avoid any entrapment of the solution after treatment. Clean the part thoroughly following treatment with all residual solution removed.

c. Serious copper corrosion is evident by the accumulation of green-to-blue copper salts on the corroded part. Remove these products mechanically using a stiff bristle brush, brass wire brush, 400-grit abrasive paper or bead blast with glass beads, (specification MIL-G-9954, size 13). Air pressure when blasting should be 20 to 30 psi for direct pressure machines. Do not bead blast braided copper flexible lines. Reapply a surface coating over the reworked area. Chromic acid treatment will tend to remove the residual corrosion products.

WARNING: Brushing, sanding, and abrasive blasting of copper and copper alloys can be dangerous due to the creation of toxic airborne particles. Take necessary precautions to ensure safety.

6-181. TITANIUM AND TITANIUM ALLOYS are highly corrosion resistant because an oxide film forms on their surfaces upon contact with air.

a. When titanium is heated, different oxides having different colors form on the surface. A blue oxide coating will form at 700 to 800 °F; a purple oxide at 800 to 950 °F; and a gray or black oxide at 1000 °F or higher. These coatings are protective discolorations and should not be removed.

b. Corrosive attack on titanium surfaces is difficult to detect. It may show deterioration from the presence of salt deposits and metal impurities at elevated temperatures so periodic removal of surface deposits is required. However, if corrosion develops on titanium, it usually occurs as pitting. Acceptable methods for corrosion removal are:

(1) Stainless steel wool or hand brush.

(2) Abrasive mats, cloths, and papers with either aluminum oxide or silicon carbide grit.

(3) Dry abrasive blasting using glass beads (spec. MIL-G-9954) sizes 10-13 or Aluminum oxide (spec. MIL-G-21380, type I, grades A or B) at a blast pressure of 40 to 50 psi (if using suction equipment use 50 percent higher pressure).

WARNING: Dry abrasive blasting of titanium alloys creates sparking. Ensure that hazardous concentrations of flammable vapors are not present.

(4) Hand polish with aluminum polish and soft cloth.

c. **Titanium surfaces** are susceptible to hydrogen embrittlement that can induce stress corrosion and associated pitting. Therefore, chemicals such as fire-resistant hydraulic fluids must be controlled. Chlorinated hydrocarbon solvents and chemical corrosion removers are prohibited from use on titanium and titanium alloys.

6-182.—6-192. [RESERVED.]