SECTION 3. CORROSION PROTECTION MEASURES FOR BASIC MATERIALS

6-29. GENERAL. In the repair of aircraft, apply corrosion proofing of the same type or equivalent to that originally applied unless the repair would result in increased susceptibility to corrosion, in which case use additional corrosion protection measures. The following is a list of the most commonly-used corrosion-proofing techniques.

6-30. ANODIZING AND RELATED PROCESSES. In anodizing, aluminum alloys are placed in an electrolytic bath causing a thin film of aluminum oxide to form on the surface of the aluminum. This is resistant to corrosion and affords a good paint base. However, other processes, which do not provide as good a corrosive protection as anodizing, are good paint bases. The processes are:

a. Alkaline cleaning followed by chromic acid dip;

b. Alcoholic phosphoric acid cleaner; and

c. Alkaline dichromate treatment.

6-31. PLATING. Steels are commonly plated with other metals to prevent corrosion. Plating is accomplished by placing the article in an electrolytic bath. Metals used in plating vary in the corrosion protection they afford steel. For instance, in platings that corrode before steel, such as zinc or cadmium, slight breaks or cracks throughout the plating will not result in rusting of the exposed steel. With the surface metal corroded, the steel is protected. However, when the steel corrodes faster than the plate metal, such as chromium, the amount of protection depends on the tightness of the plating. Post-plate bake treatment to relieve hydrogen embrittlement is a necessary part of replating procedures for high-strength steel parts. High-strength nuts and bolts are susceptible to failure from hydrogen embrittlement. Because of the potential failures of embrittled parts, careful control over the heat treatment, grinding, preplate cleaning, plating, and post-plate baking of high-strength parts is necessary.

6-32. PHOSPHATE RUST-PROOFING. This process is commercially known as Parkerizing, Bonderizing, Granodizing, etc. The coating placed on the part is used to protect steel parts after machining and before painting.

6-33. CHROME-PICKLE TREATMENT. Magnesium parts which have been immersed or brushed with a solution of nitric acid and sodium dichromate will be protected for temporary storage. The coating will also serve as a bond for subsequent organic finishes. Sealed chrome-pickle treatment is used on magnesium parts for long term protection. Diluted chromic acid is a touch-up treatment. It is less critical to apply and can be applied over previously-applied thin chromate films.

6-34. DICHROMATE TREATMENT. This treatment consists of boiling magnesium parts in a solution of sodium dichromate. It provides good paint base and protective qualities on all standard wrought magnesium alloys except the magnesium-thorium alloys. Acid pickling of the magnesium surface prior to application of the dichromate treatment is required if maximum corrosion resistance of the finish is expected.

6-35. STANNATE IMMERSION TREATMENT. Stannate immersion treatment deposits a layer of tin. It is a protective paint base for magnesium alloy parts which contain inserts and fasteners of a dissimilar metal such as brass, copper, or steel. This treatment cannot be used with parts containing aluminum inserts or fasteners because the high alkalinity of the bath attacks the aluminum.

6-36. GALVANIC ANODIZING TREATMENT. An electrolytic process that provides a paint base and corrosion-preventive film on magnesium alloys containing manganese.

6-37. CLADDING. Aluminum alloys which are susceptible to corrosion are frequently clad with pure aluminum. Slight pits, scratches, or other defects through the cladding material must be avoided, since the aluminum alloy core will corrode rapidly.

6-38. METAL SPRAYING. Metal is melted and sprayed on the surface to be protected. The surface must be properly prepared and thoroughly cleaned to prevent peeling of the sprayed coat.

6-39. SHOT-PEENING. Shot-peening and other treatments, by which the surface can be placed in compression, are effective in preventing stress corrosion.

6-40. ORGANIC COATINGS. Zinc chromate primer, enamels, chlorinated rubber compounds, etc., are organic coatings commonly used to protect metals.

6-41. DOPE PROOFING. When doped fabrics are applied over an organic finished metal structure, the dope will have a tendency to loosen the finish on the metal. For this reason, organic coatings on the metal are usually covered with a dope-proof paint, with metal foil, or with cellulose tape to prevent the dope from soaking through.

6-42. TUBE INTERIORS. Protect the interiors of structural steel and aluminum tubing against corrosion. A small amount of water entrapped in a tube can corrode entirely through the tube thickness in a short period. Coat the tube interior by flushing with hot linseed oil, paralketone, or other approved corrosion inhibitor. The flushing liquid is usually introduced through small holes drilled in the tubing. Allow the flushing liquid to drain and plug the holes with a screw or by other means to prevent entry of moisture. Air and watertight sealing of the tubing will also give adequate protection against corrosion if the tubing is internally dry before being sealed.

6-43.¾ 6-49. [RESERVED.]