

## Recommended Procedure for Cleaning and Passivation of Beryllium Parts

### SCOPE

1. This specification establishes the procedure for the cleaning and passivation of beryllium parts.

### REQUIREMENTS

1. Material and equipment:
  - a. Vapor degreaser
  - b. Trichloroethylene (or equivalent, check local health regulations)
  - c. Oxalic acid (10 grams/100 ml of distilled water)
  - d. BERYLCOAT "D"

### CLEANING PROCESS

1. Vapor degreasing: (Heavy soiled or greasy parts should be vapor degreased.)
  - a. Place part in vapor phase till the vapor ceases to condensate.
  - b. Wash parts thoroughly in clean trichloroethylene.
  - c. Re-immers parts in vapor phase.
2. Immersion cleaning:
  - a. Immerse parts in clean solvent (trichloroethylene) for 10 to minutes with periodic agitation of parts or solvent.
  - b. Remove parts from solvent and let drain for several minutes.
3. Re-immers parts in fresh solvent (trichloroethylene) for one to five minutes.
4. Dry parts with clean dry air or nitrogen. Care must be taken to insure adequate cleaning and drying of recessed areas and holes.
5. Immerse parts in clean distilled or deionized water and check for "water break free" surface.  
NOTE: If contamination is still evident, gently scrub affected areas with cleaning solution (trichloroethylene) and repeat steps 3, 4 and 5.

### PASSIVATE

1. Immerse parts in a 10% oxalic acid solution for 10-20 minutes. (Parts and solution must be at room temperature).
2. Water wash thoroughly in clean deionized or distilled water. Passivate immediately.
3. Immerse parts in BERYLCOAT "D" passivation solution for 30 minutes. Gently agitate parts or solution periodically to insure complete coverage and to dislodge any bubbles which might form on the parts.  
NOTE: BERYLCOAT "D" passivation solution must be thoroughly agitated immediately prior to immersion of parts.
4. Immerse or flood parts with deionized or distilled water for 5-10 minutes.
5. Dry parts with clean dry air or nitrogen. Drying may be accomplished by placing parts in an air circulating oven operated at 200 F.  
NOTE: Clean white lint free gloves, clean polyethylene gloves, rubber gloves or tongs should be used in handling parts after removal from cleaning fixture or racks.

### PRECAUTIONS

1. Do not use tap water.
2. Agitation of the parts or solution is required during all immersion operations.
3. Parts and solutions should be maintained at room temperature except during oven drying. Parts should be cooled to room temperature following oven drying and prior to performing additional operations.
4. The oxalic acid solution should not be stored but made fresh for each batch of parts. The solution will deteriorate with use and should be discarded after processing approximately 200 square inches of surface area of parts per liter of solution.
5. BERYLCOAT "D" passivation solution will deteriorate with use and should be discarded after processing approximately 400 square inches of surface area of parts per liter of solution.

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6. BERYLCOAT "D" passivation solution has an approximate shelf life of 90 days. To insure the application of an adequate corrosion barrier, the BERYLCOAT "D" passivation solution should be replaced after 70-90 days.

Note: Handling Aluminum-Beryllium Alloys in solid form poses no special health risk. Like many industrial materials, beryllium-containing materials may pose a health risk if recommended safe handling practices are not followed. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals.

The Occupational Safety and Health Administration (OSHA) has set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Material Safety Data Sheet (MSDS) before working with this material.

For additional information on safe handling practices or technical data on Aluminum Beryllium Alloys, contact Materion.

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