

BERYLCOAT D

Effective April 2, 2012

Rev. A

1.SCOPE

Berylcoat D is a proprietary solution available from Materion Brush Inc. Treatment with Berylcoat D forms a thin passivation coating less than 100 Angstrom units thick on the metal surface. The coating provides increased corrosion resistance and shelf life in environments of high humidity and moderately elevated temperature. The coating does not alter the dimensional tolerances nor the metallic appearance of the metal.

2.MATERIALS

- 2.1. Recommended solvents are Methyl Ethyl Keytone (MEK), Acetone followed by an Iso-propanol rinse.
Caution: Use solvents in accordance with manufacturers"/OSHA guidelines to avoid health and safety risks.
- 2.2. Deionized or distilled water.
- 2.3. 10% Oxalic Acid Solution
- 2.4. BERYLCOAT D Concentrate

3.NOTES

- 3.1. Use of BERYLCOAT D concentrate.
 - 3.1.1. Make up BERYLCOAT D passivation solution by mixing BERYLCOAT D Concentrate with an equal volume of distilled or deionized water. Thoroughly agitate the Concentrate prior to mixing. Undiluted BERYLCOAT D Concentrate should NOT be used for surface treating beryllium parts.
 - 3.1.2. Once opened, BERYLCOAT D Concentrate has an approximate shelf life of 120 days.
 - 3.1.3. The mixed 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.
 - 3.1.4. The action of BERYLCOAT D passivation solution will deteriorate with use and the solution should be discarded after processing approximately 1600 square inches (1 square meter) of surface area of parts per gallon (4 liters) of solution.
 - 3.1.5. BERYLCOAT D passivation solution should be thoroughly agitated immediately prior to the immersion of parts.

3.2. Oxalic Acid Solution

- 3.2.1. A 10% oxalic solution is made up by dissolving 10 grams (0.35 oz.) oxalic acid crystals in 100 ml (3.3 oz) of distilled or deionized water.
- 3.2.2. The oxalic acid solution should not be stored, but made fresh for each batch of parts.
- 3.2.3. The action of the solution will deteriorate with use and the solution should be discarded after processing approximately 1300 square centimeters (200 square inches) of surface area of parts per liter (quart) of solution.

4. GENERAL PROCESSING RECOMMENDATIONS:

- 4.1. NEVER use tap water.
- 4.2. Parts should NOT be handled with bare hands while carrying out any part of the procedure. The use of clean white lint-free gloves, clean polyethylene or rubber gloves as well as non-metallic or plastic coated cleaning fixtures, racks, containers or tongs is recommended. Avoid the use of uncoated metallic processing equipment especially those made of aluminum.
- 4.3. Agitation of the parts or solution is required during all immersion operations.
- 4.4. All solutions should be maintained at room temperature. Parts MUST be at room temperature prior to immersion in any of the working solutions.
- 4.5. The surface passivation film on a BERYLCOAT D treated beryllium part can be removed without attacking the beryllium by immersion of the part in a 10% oxalic solution for 20 minutes with periodic agitation. A dilute nitric acid solution of less than 5% concentration may also be used. In this instance, caution must be observed since dilute nitric acid may also attack the beryllium part.

5. PROCESS PROCEDURE

5.1. Cleaning

- 5.1.1. Heavy contamination (cutting fluids, oil, grease, dirt, etc.) should be cleaned from parts prior to proceeding with the following cleaning procedure.
- 5.1.2. Immerse lightly soiled or vapor degreased parts in clean solvent for 15 minutes with agitation of the part or the solvent. (If available, ultrasonic solvent cleaning is preferred.) Remove parts from the solvent and allow draining for several minutes.
- 5.1.3. Immerse parts in fresh, clean solvent with agitation for 5 minutes. (Remember, when using acetone as a solvent to follow with an isopropyl alcohol rinse.)
- 5.1.4. Dry parts with a flow of clean dry air nitrogen. For NON-FLAMMABLE solvents, drying may also be accomplished by placing the parts in an air circulating oven operated at a temperature between 90° and 120° C (200° and 250° F).

NOTE: Exercised care to insure adequate cleaning and drying of recessed areas and holes.
- 5.1.5. Wash parts thoroughly in deionized or distilled water using agitation or flooding. Check for water-break free surface. If contamination is still evident gently scrub the affected areas with soft, lint-free cloth or tissue saturated with solvent and repeat steps 5.1.2. to 5.1.5.

BRUSH BERYLLIUM & COMPOSITES

14710 W Portage River South Rd
Elmore, OH 43416-9502
P: 419.862.4533 or 419.862.4171 Intl: 419.862.4127
e: beryllium@materion.com

MATERION BRUSH INC.

www.materion.com/beryllium

5.2. Surface Activation Treatment

- 5.2.1. Immerse parts in a 10% oxalic acid solution for 20 minutes with periodic agitation. Parts and solution **MUST** be at room temperature. Other acid etch-treatments, such as that used for chemical milling or to remove machining damage to a minimum depth of 0.05 millimeter (0.002 inch), are also a suitable surface activation treatment prior to passivating with BERYLCOAT D solution.
- 5.2.2. Wash parts thoroughly in clean deionized or distilled water using agitation or flooding. **PASSIVATE IMMEDIATELY.**

5.3. Passivation

- 5.3.1. Thoroughly agitate the BERYLCOAT D passivation solution immediately prior to immersion of the parts. Immediately immerse parts in BERYLCOAT D passivation solution (prepared as above) for 30 minutes. Gently agitate parts or solution periodically during the passivation treatment in order to expose the surface to fresh solution and to dislodge any bubbles that may form on the parts.
- 5.3.2. Wash parts thoroughly in deionized or distilled water using agitation or flooding for 3 minutes.
- 5.3.3. Triple rinse by immersing parts (with periodic agitation) in at least three separate baths of fresh deionized or distilled water for 10 minutes each time to remove all traces of BERYLCOAT D passivation solution.
- 5.3.4. Dry parts in a flow of clean dry air or nitrogen. Drying may also be accomplished by placing parts in an air circulating oven operated at a temperature between 90° and 120° C (200° and 250° F).

6. SAFETY / ENVIRONMENTAL

- 6.1. Handling Beryllium Containing Material 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 Beryllium Containing Material, contact Materion Brush Beryllium & Composites, EH&S Product Steward @ 216-383-4040

BRUSH BERYLLIUM & COMPOSITES

14710 W Portage River South Rd
Elmore, OH 43416-9502
P: 419.862.4533 or 419.862.4171 Intl: 419.862.4127
e: beryllium@materion.com

MATERION BRUSH INC.

www.materion.com/beryllium