MATERION

TECH BRIEFS

Cleaning MoldMAX® and PROtherm® Molds

The following procedures were developed for MoldMAX HH®, MoldMAX LH®, and PROtherm® copper beryllium mold materials. However, these will also work for MoldMAX XL® (copper nickel tin) and MoldMAX V® (copper nickel silicon chromium).

REMOVING "GREENISH" CORROSION PRODUCT

There are a few methods of removing corrosion product:

1. Immerse mold in a 20% by volume Ammonium Hydroxide (NH_4OH) solution. Add concentrated NH_4OH to water to make this solution. Heat solution to 110 - 120°F (43 - 49°C) and immerse mold for 45 – 90 seconds. Corroded areas can be lightly brushed with a soft bristle brush while in the solution. The solution will turn blue due to the reaction of ammonia with the copper. This procedure will not remove any significant metal off the gauge. Rinse well to remove all solution from various mold openings. Perform procedure under an exhaust hood.

2. Immerse mold in a 20% by volume Hydrochloric Acid solution. Add concentrated HCl to water to make this solution. Heat solution to 125°F (52°C) and immerse mold for 45 - 60 seconds, depending on extent of corrosion product present. Rinse well to remove all acid solution from openings in mold. This procedure will not remove any significant metal off the gauge. Lightly brushing corroded areas with a soft bristle brush will assist in removing corrosion. Perform procedure under an exhaust hood. (There may be a reaction between steel pins and other mold components with the Hydrochloric Acid which could result in some steel metal loss).

BRIGHTENING THE SURFACE OF THE MOLD

Bright Chemical Polish

Formula: 65% Glacial Acetic Acid, 32% Phosphoric Acid, 3% Nitric Acid

Use commercially available concentrated acids and measure by volume when making this solution. Do not use any water in this solution. Heat solution to 140 - 149°F (60 - 65°C). Immerse mold for 30 - 60 seconds and immediately rinse in hot tap water. Rinse well in order to remove all acids from various mold openings. If slight staining occurs after thorough rinsing, immerse mold in an acid rinse of 5% nitric acid solution at about 100 - 110°F (38 - 43°C). Rinse again. Perform procedure under an exhaust hood as fumes are generated. This polish procedure does remove metal off the gauge on the order of 0.1 to 0.2 mils (0.0001" - 0.0002" or 2.54 to 5.08 μm) for the time period specified above.

Sulfuric Acid Pickle

Formula: 20% Sulfuric Acid, 80% Water

Make up solution by volume and heat to 125°F (52°C). Immerse mold for 45 - 90 seconds and rinse well. This pickle will brighten and clean up the surface, but not to the extent of the Bright Chemical Polish. This pickle assists in removing tarnish and will not remove any significant metal off gauge. However, there may be a reaction of the acid with any steel mold components. Perform this procedure under an exhaust hood.

SAFE HANDLING OF COPPER BERYLLIUM

Please refer to the Materion Corporation publications "Safety Facts 104 - Safety Practices for the Chemical Processing of Small Copper Beryllium Alloy Parts", and "Safety Facts 105 - Processing Copper Beryllium Alloys."

Handling copper beryllium 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

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technical data on copper beryllium, contact Materion Brush Performance Alloys, Technical Service Department at 1-800-375-4205.

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