

# Mg Polish Recipe

All of these steps are done on a Buehler EcoMet 3000 polisher at approximately 200rpm by hand.

- 1.) I usually start with a 800 Grit sandpaper or so to get any grooves or scratches out of the surface. I use lots of water just to lube and keep cool. This usually takes thirty seconds or so of polishing.
- 2.) I then switch to using Monocrystalline Diamond Suspensions and Vel-Cloth (Allied #90-150-400). I start with a 9um suspension and polish in several orientations until I am confident I have removed features bigger than 9um(couple minutes). To end the step I move the sample outwards to a relatively clean section of pad and add DI water until I'm polishing with all DI water. End of step dilution takes ~30 seconds. I then lift the sample from the pad, rinse with DI water and immediately dry with Nitrogen blower.
- 3.) Repeat #2 with 3um.
- 4.) Repeat #2 with 1um.
- 5.) I then use 0.3um Alumina Powder (Allied #90-187085) on a Kempad (Allied #90-150-003). I create a paste on the pad with DI water and polish until I have removed any features larger than 0.3um (about a minute or so). To end the step I do the same dilution, rinse and dry as in the previous steps.
- 6.) For the last step I use 0.02um Colloidal Silica (Allied #180-40000) on a Chem-Pol pad (#180-10045). I also set a clean Chem-Pol pad on the counter next to the polisher. The polish, dilution and rinse are the same as previous steps. Before the dry I polish the sample on the clean Chem-Pol pad on the counter with just a little bit of DI water. Then rinse and immediately dry.  
It may take several iterations (minute or so per) of step #6 to get a perfect surface. When the surface is really good, at least on the Mg, the surface will not wet. When you rinse it the water will bead and run off.

If you polish with just water for too long the surface may become wavy.

All of the alloys seem to like or be sensitive to different things....time, pressure, length of time in water.

It is a little tricky to get good samples. There are three people here who have used this method. Me and one of the others have about a 90% success rate. The third person has about a 50% success rate.