

Polishing Sonex Non-Clad Aluminum Sheet Metal

Thanks for using Nuvite! The following method using Nuvite NuShine II Metal Polishes will polish non-clad aluminum sheet stock, -as used on Sonex aircraft, giving you an outstanding finish and a show-quality shine. Sonex aluminum as supplied in the kit is 6061 non-clad aluminum sheet stock. However, with this kind of metal sheet, almost by definition, it is “mill finish”, and to get a good final finish, it requires some special, -but not hard work vs. the process used for “clad” aluminum sheet (100% aluminum “clad” over the surface of the alloy). This is because, when you polish the actual alloy, you are working with a much harder surface than would be the case if you were polishing clad material, which is soft. The good news is that once polished, the non-clad stock will resist dulling from atmospheric oxidation much longer than does clad material! Our experience with non-clad material polished as follows has been excellent.

Nuvite NuShine II metal polishes are manufactured in various grades to match the needs of the original metal condition in the compounding phase of polishing. This system makes it ideal to deal with non-clad, mill-finish aluminum sheet stock. Following the use of a compounding grade of NuShine II polish, the final finish is always done with NuShine II Grade S that gives you that really bright, fine and deep image, with no machine swirl marks.

The mill finish usually means that there are fine surface lines over the whole surface from the rollers that formed the sheet. Because Nuvite NuShine II is a "burnishing" type of polish (does not grind away the rough spots as other kinds of polishes do), the compounding phase is meant to merely roll the microscopic high spots and low spots together into a smoother and more reflective surface. We call it "healing the surface". Once this compounding phase is complete, the lines, or “grain” will be minimized or smoothed altogether, and the surface is ready to take a high and deeply transparent shine with an excellent, mirror-like image reflectivity.

Polishing Procedure

Compounding Phase:

- Assure that the surface to be buffed is clean, dry and free from oils & water.
- Using Nuvite NuShine II Grade F9, put wet “fingerprints” of polish every 3” over a 2’ X 1 _’ area to be compounded. Compound buff using 2000-2500 rpm rotary buffer and 100 % wool “compounding” pad. (Nuvite EQ-140 or 3M #05711). “Compounding” pads can be identified by the tufted pad face that is “twilled” into tufts, similar to a cut-pile carpet. Do not use standard “loose wool” pads.
- Move the buffer back and forth over the area with sweeping passes. About 2 to 3 seconds per foot seems to work well as a starting suggestion.

Some weight can be placed on the buffing, but keep the buffer moving to prevent overheating the surface. Do not slowly “grind” across the surface. Moving slowly, especially when the surface is still relatively rough, can cause overheating both the metal and the polish. The surface will get hot as you buff, but will cool quickly as you move over other areas of the buffed areas.

- In 30 to 45 seconds, the black polish residue should come off the surface, leaving a clean, clear surface. If the black, wet residue remains on the surface longer than 30- 45 seconds, too much polish is being used, and the desired surface burnishing action is reduced.
- Repeat the above over the same area. The more passes, the more the blending action will ease the mill roller “grain” and the smooth the metal surface. We recommend two passes as a minimum. Four passes will give a smoother surface, although even more passes will not harm the metal or its’ properties. As a suggestion, areas that will be out of sight –top of wings on a high wing plane (bottom on low wing) and the belly, will look great after two passes, while “high-visibility” areas, such as underside of the wing (high wing – top surface of a low wing) and the fuselage turtledeck, cowl & sides get four passes to get that extra, up-close, smooth finish.
- Move on to the next area, and so on.
- When through with buffing for the day, thoroughly clean the surface of any F9 polish residue around fasteners/seams/joints, etc. Microfiber cloth is very effective when polish is still fresh, and seems to have an affinity for the accumulated polish.
- Follow the above with a second phase of compound buffing, two passes only, using identical procedures, with Nuvite NuShine II Grade C. This pass will brighten the surface color to a high, bright shine, but polishing marks on the surface will be visible. These are taken out with the final finish pass. Use fresh buffing pads (not impregnated with F9 polish). It is always wise to mark pads to keep the process organized so that a stronger grade polish is not introduced during compounding with a finer grade (i.e., later in the process).
- When polishing a kit type aircraft, we recommend that at least the compounding polishing should be done before assembly – on a padded bench or similar such as an assembly jig, so that overhead and “lying down” polishing effort is avoided. Completing the compounding phase while unassembled and doing the final finish after assembly will minimize the muscle strains.

- Final finish: Using an orbital buffer, such as the Cyclo Model 5 (Nuvite EQ-137) with a 100% cotton flannel sheet (cotton “sweatshirt” material) wrapped over the buffing pad(s) (Nuvite EQ-145), final buff with Nuvite NuShine II Grade S. Put one wet “fingerprint” every 6” over 2’ X 1 _’ area. Buff with continuously moving sweeping action. Do not slowly “grind” across the surface. Polish residue should disappear after 30-45 seconds. Buff until surface is clear and clean of polish.
- Move on to the next area, and so on.
- “Clean buff” – use a lightly used flannel spot over the buffing head(s) and spot buff any leftover polish residue areas. Follow with a “dry” pass (no polish) with long, wide buffing sweeps, using a clean flannel for final surface cleanup.
- It is very important to keep the flannel sheet face clean. Fold sheets face-to-face for stock storage. When using in the polishing environment, make sure that the flannel “fleece” or polishing face side comes in contact with surfaces that are clean and free from any earlier polishing residue. An easy way to insure that the flannel fleece is not contaminated with dirt and dust is to use a roll of “butcher paper” and unroll a clean sheet each time for the flannel face to lay on when wrapping around the buffing head(s).
- Although this can be as much a process as preparing for painting might be, you will find that once done, the shine and longevity of the polished non-clad material is exceptionally good. Quite a bit better than with aircraft built of clad material, although they will get better over the years as they are buffed over and over until the clad is burnished smooth and “tight” with no oxidation on the surface.
- For most homebuilt, all metal, 2-passenger size aircraft, you will need approximately 1 pound of Nuvite NuShine II Grade F9, _ pound of Nuvite NuShine II Grade C and _ pound of Nuvite NuShine II Grade S to accomplish the process as described above.
- We have had reports that the polish on non-clad aircraft will not be affected when wipedown debugging and cleaning with normal wetwash cleaners such as Nuvite CitriCut, using standard dilution as directed. Do not allow CitriCut or any other citrus-type cleaners to contact your polycarbonate windscreens or side windows, however. They are not approved for polycarbonates such as “Lexan”. For acrylics such as Plexiglas, CitriCut is tested and certified for use.
- Polishing has advantages, as well. It is likely you will spend a great deal less than the cost of the paint, primer labor and other materials, the

needed surface preparation for painting does not take a great deal less time and effort than this polishing process, and your aircraft will be lighter.

- Another consideration is that you will most likely find the grass around your airplane to suffer greatly more traffic damage at airshows than others.

Also: FYI –

1. Yes, you can paint over areas polished with Nuvite NuShine II polishes with thorough, standard surface preparation. Although, as a suggestion, painting after the compounding phase, and before you do the final finish would be ideal. Final polishing will not harm cured paint or masked areas. Use Nuvite NuImage to clean black residue off paint after polishing – works great for debugging and cleanup of polished metal without fogging, too.
2. If you have surface scratches and blemishes that the above polishing procedures will not remove, contact Nuvite for specific procedures.
3. No, we do not know of any coating that will help to protect your polish job beyond the protection built into NuShine II. Anything between you and the finish you will achieve WILL dull the image you see, and when you are ready to polish again, you will have to etch strip the coating away to keep it from fouling the buffing pads, the polish, and the expected result. Stripping will cause you to have to start the “healing” process all over again.
4. If you allow water to dry on the surface of your polished airplane, it is almost certain to get hard-to-remove white spots in the image. This comes from the dust from the air that contains salts and alkalines that dissolve in the water spots. As the spot dries, the water goes away, leaving a stronger and stronger “brine” of chemicals that will etch into your surface. It does the same thing on paint. It can be avoided by wiping the surfaces dry with a synthetic chamois or similar prior to the moisture drying up.
5. Most likely, you will find the need to repolish again before the first year is up –just a quick pass with Grade C and finish with Grade S as before –not the whole compounding process. However, after that, experience has shown, that with reasonable care, your polish job will remain quite acceptable for as long as a year or maybe longer, depending on weather encountered and storage care. This is consistent with the metal surface being “healed” to a tight, oxidation-free surface.
6. “Show Finish” Hangaring suggestion: In high humidity climates, in closed hangars with concrete floors – keep a small fan running slowly during the

high humidity months – not blowing hard – just moving the air a bit. In extreme situations, borrow some used, discarded carpet from the dumpster out behind the carpet store, and place it on the concrete floor under the area of the airplane. No need to cover the whole floor – just where the plane sits.

Finish polishing your aircraft will put that “Exclamation Point” of your pride in the project. No finish, however good or expensive will out-draw show crowd interest as a well polished airplane (–experts and the “Ohh and Ahh’ers” as well!). Nuvite stands ready to help you at any point along the way to help you get to that beautiful final finish. We are available toll-free for Technical Support at (888) 326-6489. Call if you have questions. Thank you for using Nuvite Chemical Compounds Corporation products!