



ProMask/ProLegend

The ProMask and ProLegend kit is used for adding silkscreen graphics and the top insulating green layer on the PCB

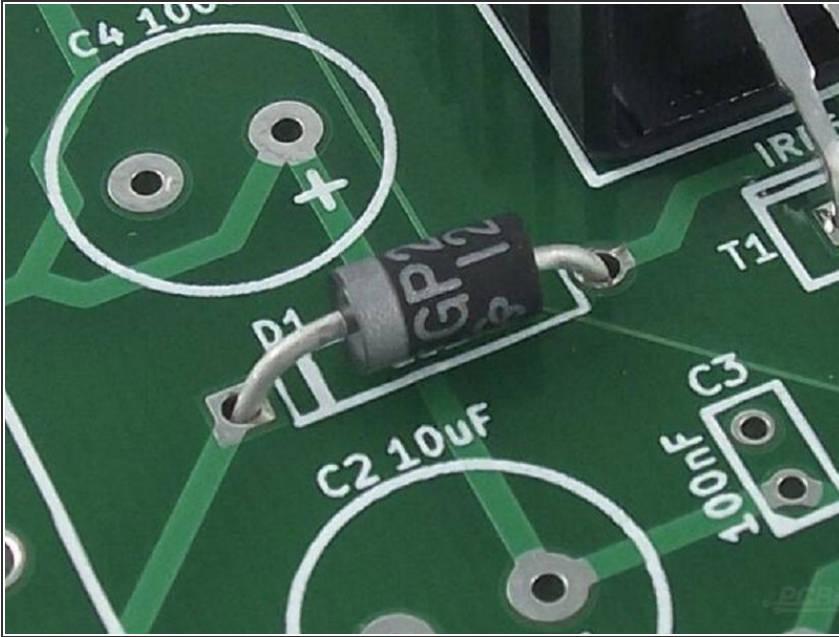
Written By: Jimmy Nolan



Introduction

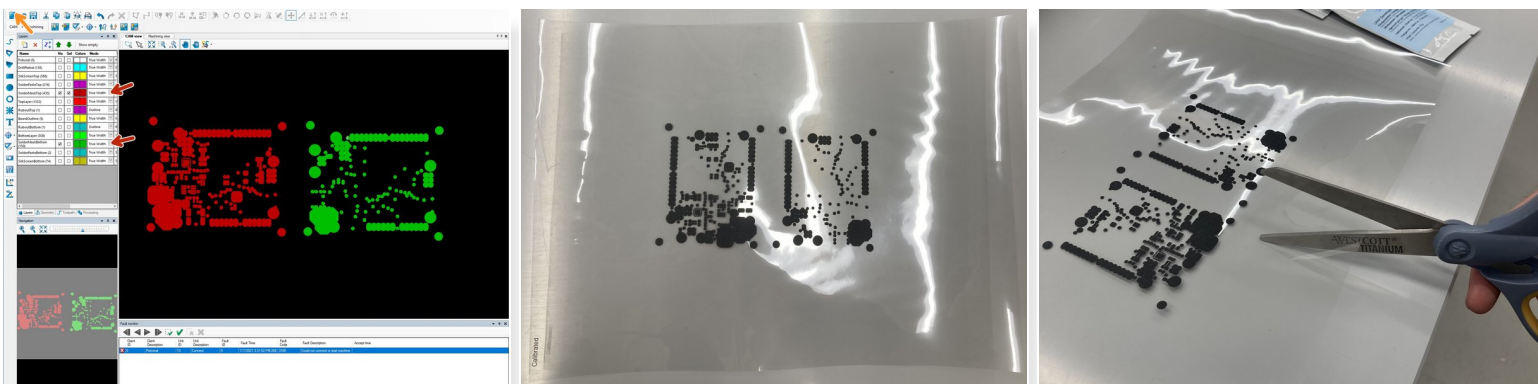
This guide will teach you how to use the ProMask and ProLegend kit to add the green solder mask layer silkscreen graphics to your PCB.

Step 1 — Solder mask and silkscreen intro



- Solder mask is what makes circuit boards green and is used to protect the board and make soldering easier.
- Silkscreen is used to embed white text on the surface of the circuit board.
- Both of these layers must be applied to the surface of the PCB and selectively cured using a printed transparency sheet under a UV lamp.
- Solder mask and silkscreen are added after the vias are drilled/plated and the top/bottom traces on the PCB are milled.
- You should use scaling of 1:1.0021 or 1.0025 instead of 1:1 for a better result

Step 2 — Print the transparency sheets



- Open your project in CircuitPro and in the CAM view make only the top and bottom solder mask layers of your design visible and drag them apart.
- Select *File->Print* and make sure the paper comes from *Manual*.
- Make sure that the scaling is letter size paper, and 1 to 1 scaling. You can change the margins to 150mm vertical to save ink for silkscreen
 - ① You can choose *Print preview* to make sure the print will turn out correctly.
- You should use scaling of 1:1.0021 or 1.0025 instead of 1:1 for a better result
- Click *Print* and insert a transparency sheet into the front of the printer located next to the computer.
- Repeat the procedure for the silkscreen layers but check *Invert* before printing.

Step 3 — The kits



- The solder mask/silkscreen kits are kept in a brown LPKF box in one of the tall white cabinets.
- One part contains a roller, a paintbrush, handles for holding the board, and popsicle sticks
- The other contains tips for the roller, gloves, a beaker, and a bottle

Step 4 — Soldermask/Silkscreen With Goo



- The main method of solder mas is using the green/white goo/paste in tubs iin the closet.
- This tub is the Green goo, or the actual solder mask. It has a very pungent smell so try to not inhale too much fumes. It is highly viscous so be careful when measuring. 8 grams of the green goo is required for one side of a PCB
- This tub is the white goo. It is the activator that solidifies and chemically cures the green goo and turns it into solder mask. It is very paste like and a semi-solid. 2 grams are required to activate the 8 grams of green goo
- The general ratio is 8 grams green goo to 2 grams white goo to get a nice solder mask. This is about a 4:1 ratio.

Step 5 — Apply the solder mask/silkscreen



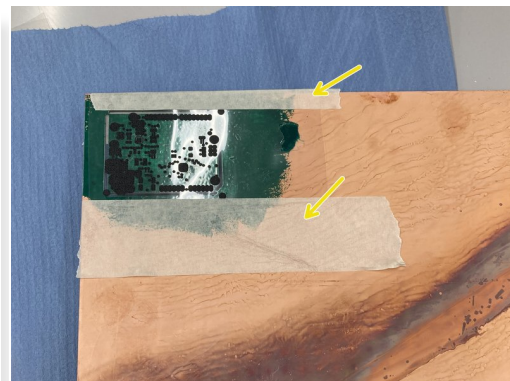
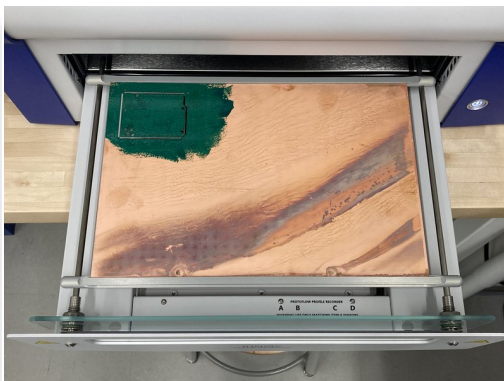
- Retrieve one packet each of ProMask components A/B, ProLegend components A/B, LPKF Developer, and LPKF Conditioner.
 - ① They are located in the fridge outside the AFL
- Place a plastic glove over the roller bin and mix ProMask compounds A and B with a popsicle stick (ProLegend A and B if you're doing silkscreen).
 - ① It may take several minutes until they are fully mixed
- Use the roller to apply the solution on both the front and the back of the PCB.
- IF using the two jars of activator and mask, it should be 8 grams of the green goo to 2 grams of the white goo.

Step 6 — Pre-Develop Cure



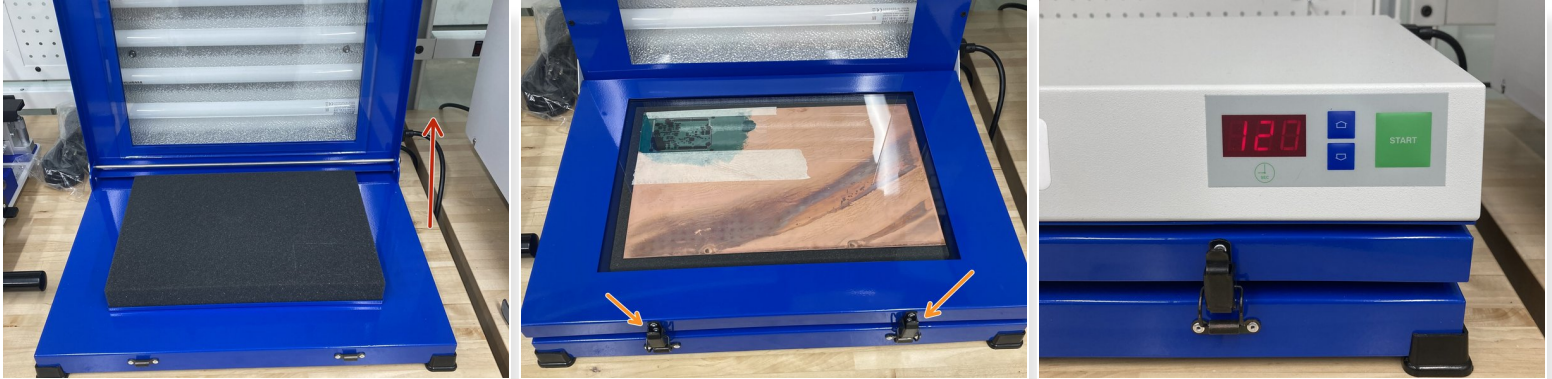
- Use the curing oven and run the ProMask-PD profile

Step 7 — Cure the solder mask/silkscreen in the oven



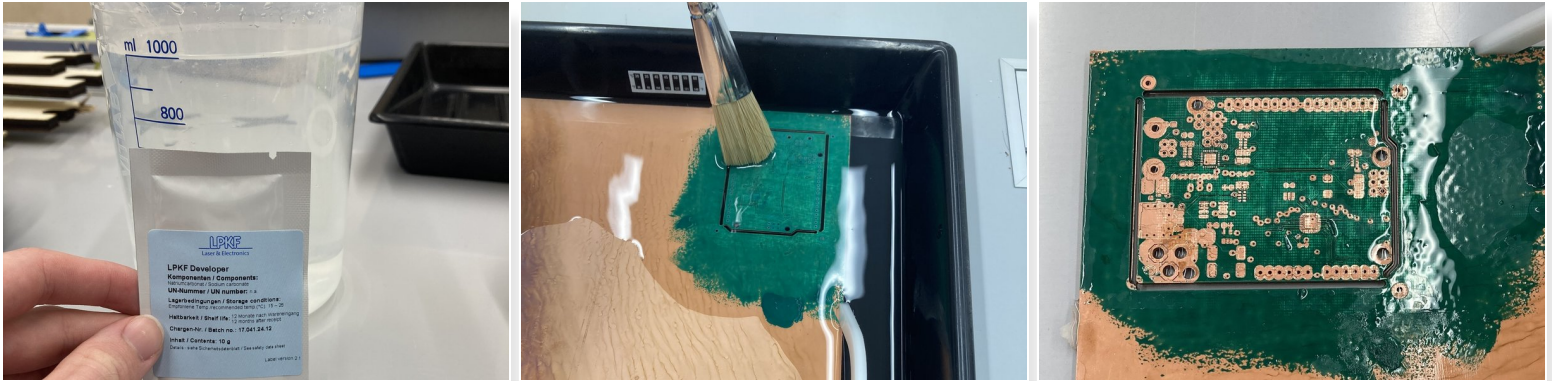
- Once a thick layer of solder mask/silkscreen is present on both sides of the PCB it's time to cure it.
- Place the PCB in the reflow oven and choose the *ProMask-PD* profile
 - ❗ [Follow the guide for the reflow oven here.](#)
- Once it is finished and cooled, line up and tape the appropriate cut out solder mask /silkscreen transparency sheet
 - ⚠ Be sure not to mix up the top and bottom layer transparencies

Step 8 — Cure the solder mask/silkscreen in the UV lamp



- Open the UV lamp
 - Place the PCB under the glass and latch it shut
 - Close the lid, set exposure to 60 seconds for solder mask and 120 seconds for silkscreen, and push start.
- ☒ Remember to cure both sides.

Step 9 — Remove the uncured solder mask/silkscreen



- Add the developer power to 1000mL of water at 40-50°C
 - ① The water does not need to be this warm for the silkscreen so you can reuse the same developer solution for both processes.
- Pour the solution into the bin provided with the kit and scrub off the uncured solder mask/silkscreen with the paintbrush

Step 10 — Postcure in the reflow oven



- Rinse the board off with water
- Place the board in the reflow oven and choose *ProMask-PC*
 - ① [Follow the guide for the reflow oven here.](#)
- Repeat the procedure starting from step 3 for the silkscreen if necessary.

Step 11 — Cleaning up



- Neutralize the developer solution with LPKF Conditioner before pouring it down the drain.
- Throw away the used plastic gloves, popsicle sticks, rollers, and transparency sheets.
- Pack up the kits and store the box away in the cabinet.