

# BBG Tech Tip #9

## Solder Mask

Solder mask or solder resist is like varnish or lacquer that is applied to the outside or top and bottom layers to form a permanent protective coating for the copper traces of a printed circuit board. The solder mask prevents solder from bridging between conductors that will create a short in the intended circuit. Solder mask was created primarily to facilitate wave soldering used in mass assembly. It also provides some protection from the environment.

Solder mask comes in different types depending upon the demands of the application. The lowest cost solder mask is a two-part epoxy liquid that is silkscreened through an artwork pattern on to the PCB. The epoxy or non-imageable masks are mainly used for lesser technology boards where design tolerances are not so tight. Liquid photoimageable solder mask (LPI) is the mask of choice in today's market of tight tolerances and dimensional controls. LPI can be either silkscreened, curtain-coated or sprayed on to the PCB. It is then exposed to a designed pattern (this is where the term photo-image comes into play) and developed to expose the openings in the pattern for parts to be soldered to the copper pads. Both processes go through a thermal cure of some type after the pattern is defined.

A peelable mask is also available. This temporary resist is screened on to the already solder masked PCB to protect circuitry from one or more soldering or assembly operations. When no longer needed, it is mechanically removed or "peeled-off" by hand and the area it was protecting prepped for the final assembly operation.

The solder mask is most often applied with a green tint but is available in a wide variety of colors and finishes. As a side note, it is rumored that green became the standard color because of military applications.

*Research for the above information may be from, but is not limited to, IPC reference manuals, the PCB Handbook, the Bare Board PWB Design Manual and consultation with industry professionals. Please consult a process engineer familiar with your company's PCB assembly process before making any procedure changes.*