

An Engineer's Perspective

Inkjet Solder Mask is Worth a Closer Look

By Bob MacRae, Taiyo's Eastern Regional Sales Manager

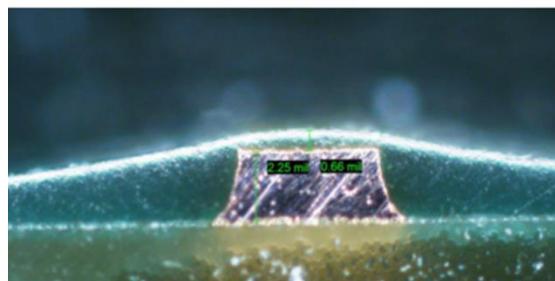
From the humble beginnings with screen printing of thermal and UV curable solder masks, through the transitions to DFSM and ultimately LPI solder masks, the main drive has always been to make the solder mask process capable of meeting the needs of ever more challenging board designs, while also making the products and process less of an operator dependent art and more of a repeatable science. Unfortunately, with each new solder mask technology came an increasing amount of process steps and parameters which must be controlled to maintain yields. Issues like mask on pads from thermal solder mask, were replaced by mask in holes and lifting webs with photoimageable products. As board aspect ratios became more challenging, so did the processing. Today, with the introduction of new solder mask formulations and the advances in solder mask processing equipment, the method used for putting solder mask on a board is taking a new path – Inkjet solder mask. I believe this will be a game changer for the industry.

With the introduction of Taiyo's IJSR-4000 Inkjet solder mask series, no longer is Inkjet a technology just out of reach on the horizon, it has become a reality and can deliver on its promises. I've seen our IJSR-4000 Series Inkjet solder masks used on increasingly complex panels and I'm very impressed with the results. Resolving 3 mil dams, bleed-free clearances, no mask in holes, control of mask thickness across the surface of the panel, which can be tailored to specific areas of the panel, are now a reality. All this from a solder mask process requiring significantly fewer steps is quite an achievement! From a final properties standpoint, our Inkjet solder masks are also at the same level of performance as LPI solder masks.

3 mil Inkjet Webs

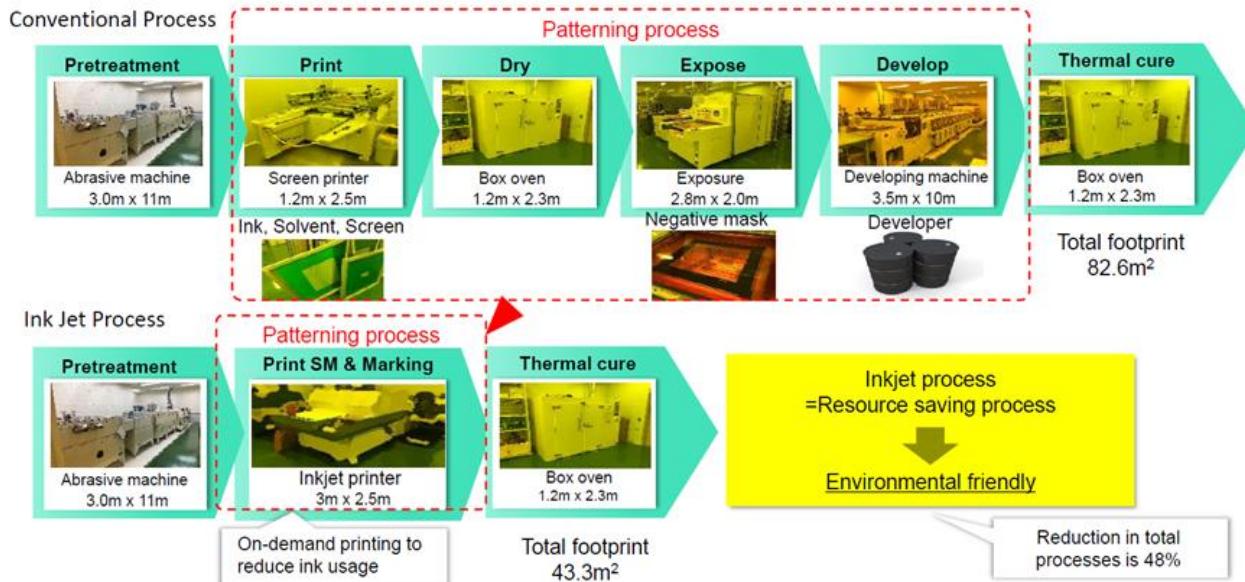


Isolated Trace Circuit Coverage



Unlike all the solder mask technologies that have come before it, Inkjet solder mask is a high definition, fully additive process, so it is only deposited where you need it reducing material waste. Compared to LPI solder masks, Inkjet solder masks require only 3 process steps – Clean / Coat / Cure. There is no need for tack dry, exposing or

developing. This significantly reduces the time required to get panels through the solder mask process and will offer many advantages such as faster turnaround times on quick-turn jobs, a reduction in labor hours and reduced impact on the environment. Looking at the process flow below, you can see the advantages as you literally cut the process in half by eliminating Tack Dry, Exposing and the Developing processes.



Eliminating these processes can also help with reducing your impact on the environment because you no longer need to deal with solvents during Tack Dry or disposing of developer chemistry.

We've just touched the surface of the benefits Inkjet solder mask can potentially offer. I'm sure you will think of more ways this new technology will improve how you make your circuit boards.