

# Solder Mask Dispensing for Electronics and Aerostructures

## Case Study

One of our customers involved with Electronics and Aerostructures requested a test to dispense Techspray Wondermask 2204 solder mask. The dispensing locations include large and small screw holes, single through-hole vias, and connector locations consisting of multiple through-hole vias. The process needed to run quickly and reliably.

## Recommended Solder Mask Dispensing Process:

A tabletop dispensing system, Island Series equipped with a volumetric PCD4L dispense pump was chosen for dispensing the Wondermask 2204 solder mask. A PCD pump is a continuously volumetric dispensing pump based on the Progressive Cavity principle. PCD technology is an innovation in dispensing for a wide range of fluids, from low viscosity coatings to high viscosity greases, providing exceptional volumetric control throughout the working life of a fluid.

Three substrates were processed separately and secured using a spring arm to press the board into a corner. The programs were then developed starting in the lower left corner. The solder mask was transferred from the 8oz bottle to a 30CC syringe for use with the PCD4L dispensing pump.

The larger screw holes were programmed for two concentric circles followed by a dot in the center to build a strong base to prevent the mask from falling through the open hole. The outer circle had the slowest dispensing velocity while the inner circle was slightly faster. The dot in the center needed to be at a higher Z position and was used to seal the hole for full coverage with material going approximately halfway down the hole.

A single circle was required to cover the pad and provide adequate surface support in the hole for a dot to finish these circles. This program was able to run at a higher dispense velocity.

The last features involved small SMT components and smaller vias, either as singles or as multiples for a connector. A single via was covered with a small dot while the connector layout was covered with a line. The lines used a moderate dispense rate to prevent pushing material through the vias. By adjusting the line length and the delays at the end of the line, the pads were covered while the neighboring vias remained clear.

## Solder Mask Dispense Parameters:

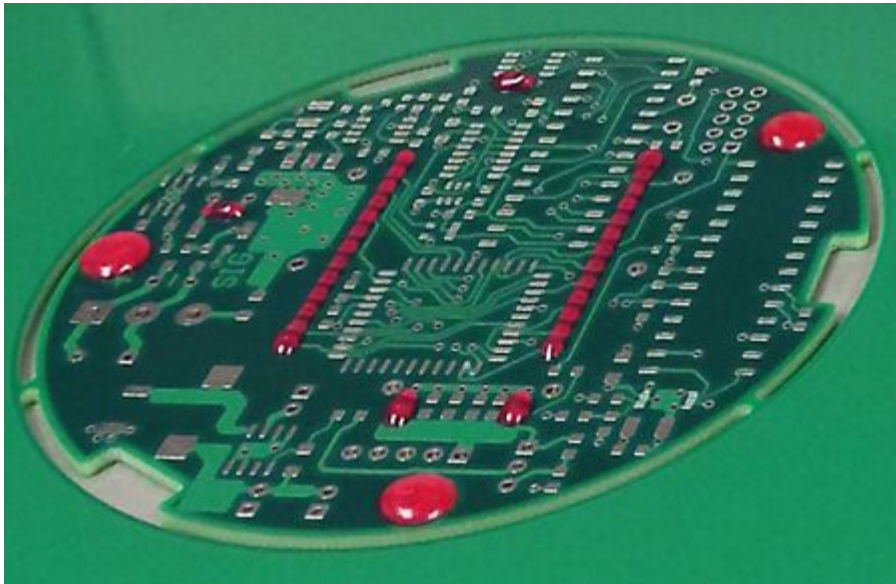
The information table below displays the key process parameters utilized for capability testing.

<b>Pump Speed:</b>	2mL/min (max speed 6mL/min)
<b>Dispense Velocity:</b>	10mm/sec – 30mm/sec
<b>Start Pause:</b>	0.2sec
<b>Stop Pause:</b>	0.15sec
<b>Z Up Pause:</b>	0.1sec
<b>Z Up Distance:</b>	5mm

## Conclusions: Solder Mask Dispensing for Electronics and Aerostructures

In summary, the programs developed for the three substrates ran with repeatable results and achieved the desired cycle time.

Graphic below shown one of the three substrates:



## Final Solder Mask Dispensing Equipment Recommendation:

<b>Dispense System :</b>	<a href="#">Island Series</a> Tabletop System
<b>Dispense Pump :</b>	<a href="#">Volumetric PCD4L</a>
<b>Material:</b>	Wondermask 2204
<b>Needle Size and Type:</b>	14G Plastic Taper

GPD Global offers [dispensing system](#) customization and [in-house application evaluations](#). Call 1.970.245.0408 or email [request@gpd-global.com](mailto:request@gpd-global.com) .

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