

VALTECH SOLUTION PTE LTD

ELECTROFORMED

STENCILS

Electro-Formed Stencil:

Applications:

Electroformed Stencils are extensively used for printing fine pitched components from 20mils to 12mils pitch QFP as well as for the microBGA, Flip Chips, CSP, Wafer Bumping (12 mils to 6mils pitch) because of its superior printing characteristics and lower defect rates.

Because of the smoother and trapezoidal aperture walls, it is very suitable for printing application down to 0.45 Area Ratio due to better solder paste release.

- **Smooth, trapezoidal sidewalls** – maximize solder paste deposit and release (greater than 95%).
- **Patented sealing gasket** – minimizes bleeding, bridging and shorts.
- **Unsurpassed tensile strength and hardness** – increased prints thanks to longer stencil life.
- **Nickel surface properties** – low surface tension enhances solder paste release.

The Electroforming Process.

Unlike subtractive etching or laser cutting processes, Electroformed Stencils are grown atom by atom around the aperture pattern created by a photoresist film deposited on a conductive surface.

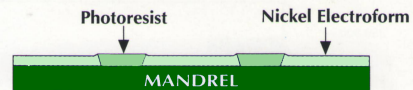
1. The coating is polymerized by light exposure through a photo mask of the board pattern.



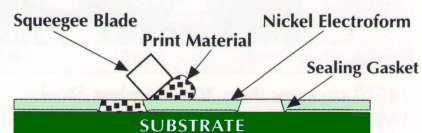
2. After developing, a negative image is created on the mandrel where only the apertures on the stencil remain covered by the photoresist.



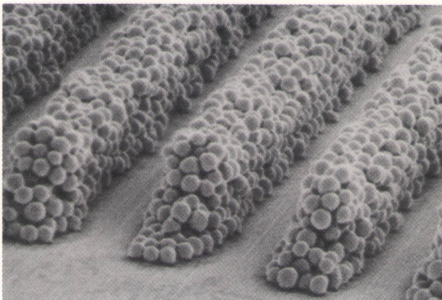
3. The stencil is then grown by nickel electroforming. The remaining photoresist is removed from the apertures and the foil is separated from the mandrel.



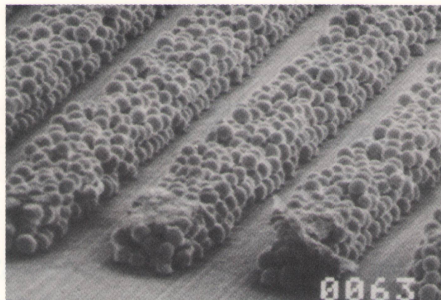
4. The stencil is then framed so that as the print material is spread across the stencil, the patented sealing gasket* helps to minimize print material bleeding, and the tapered side walls maximize material release from the stencil.



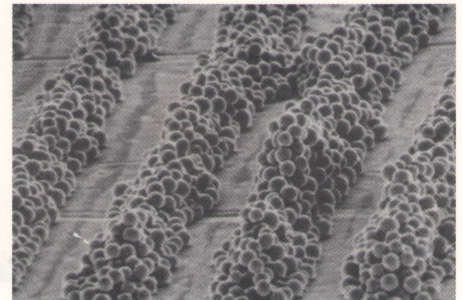
The Proof Is In The Print!



Electroformed Stencil deposit 0.0045" x 0.0875" aperture at 75x. Reveals maximum print deposit volume and resolution.



YAG Laser Cut Stencil deposit 0.0045" x 0.0875" aperture at 75x. Material transfer was not complete, leading to a 30% thinner deposit than desired.



Chem-etch Stencil deposit 0.0045" x 0.0875" aperture at 75x. Print showed bridging, voids and minimal material transfer.

Characteristics		Electroformed	YAG Laser Cut	Chem-Etch
Aperture Variability	CpK	1.31	0.61	0.39
	Defect Rates	60 ppm	60,200ppm	242,000ppm
Alternative Aperture Geometry Ability		Yes	No	No
Aperture Position Accuracy		0.0002"	0.00052"	0.00097"
Sidewalls		Smooth/Tapered	Rough	Knife Edge
Stencil Surface Tension (enhanced paste release)		Low	High	High
Thickness Control		Exceptional	Standard of metal supplier	Standard of metal supplier
Thickness Variability		Unlimited	Standard of metal supplier	Standard of metal supplier
Permanent "Board Side" Gasket		Yes	No	No
Hardness (HK ₅₀₀)		420	350	350
Tensile Strength (psi)		221,000	90,000	90,000
Fine Pitch Print Ability .016" - .020"		Excellent	Good	Fair
Ultra Fine Pitch Print Ability .010" - .015"		Excellent	Poor	Poor

VALTECH SOLUTION PTE LTD
Stencil Manufacturer and PCBA Products Supplier

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