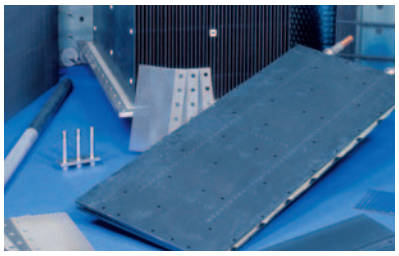
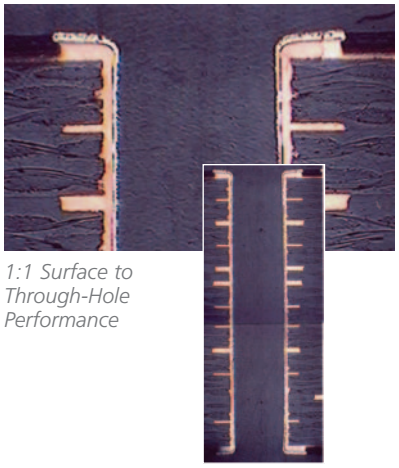
Synergy™ / DT Anodes

Printed Wiring Board Plating



Synergy Anodes Available in Numerous Configurations

Commercial High Flow Operation, Arizona — Synergy Anodes



1:1 Surface to Through-Hole Performance

Synergy™ / DT Anodes:

Provide high quality, long life performance
Offered in both standard and custom fabricated designs
Improve straight line throwing power
Copper metal plates deep into high aspect ratio holes and blind vias

PERFORMANCE ADVANTAGES

- Improved Copper Plating Distribution
- 1:1 Surface ton Through-Hole Uniformity
- Elimination of Nodules & Surface Sanding
- Elimination of Anode Sludge
- Improved Yield
- Eliminates Tedious Anode Maintenance
- Safer Operation with Light Weight Titanium Anodes
- Ability to Operate at Increased Current Density

Synergy™ Anodes Protect Organic Additives Synergy anodes have been specially formulated to protect your organic additives. Operation with Synergy anodes provides additive consumption equivalent to soluble anode experience.

Throwing Power as a Function of the Deposition Time

t = 0
Aspect Ratio = [A/B]0

t = x
Aspect Ratio = [A/B]X

Uniform current distribution plays a role in via filling. Control of the current density profile, possible with DSA® anodes, can help meet via filling requirements in production.

DE NORA

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SURFACE FINISHING

Synergy™ / DT Printed Wiring Board Plating

De Nora DSA® anodes versus Soluble Anodes

	Synergy Anodes Commercial Bath S	Soluble Cu Anodes Commercial Bath S
Anode Sludge	None	Yes
Nodules	None	Yes
Dummy Plate	No	Required
Solder Float Pass	>10X	>10X
Tensile KPSI (RT) *(125° C)*	Pass IPC Spec	Pass IPC Spec
% Elongation (RT) *(125° C)*	Pass IPC Spec	Pass IPC Spec
Brightener ml/AHr	0.32	0.33
Bath Additive Make Up	0.1% Brite 1% Carr	0.1% Brite 1% Carr
ASF	16.2	16.2

Our Commercial Experience

"We at Photocircuits have commercially operated DE NORA's Synergy anodes in our PAL line for 24+ months. The benefits that we've seen using Synergy anodes include nodule free boards, improved copper plating distribution, increased board throughput, ease of plating operation and reduced maintenance. Additionally, we have operated with our traditional bath chemistry, and observed no additional brightener consumption compared to soluble copper anodes."

Gerard O'Brien
Director of Material Test,
Reliability and Technology
Photocircuits Corp.

Other Applications for Synergy™ / DT Anodes

- **Trivalent Chrome Plating**

- Improved metal plating distribution and ease of maintenance with light weight titanium structures.

- **Gravure Cylinder Plating**

- Better plating distribution, eliminates sludge and nodules and improves maintenance.

DE NORA

www.denora.com

Durantes Vincunt

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DNOx SF10-07