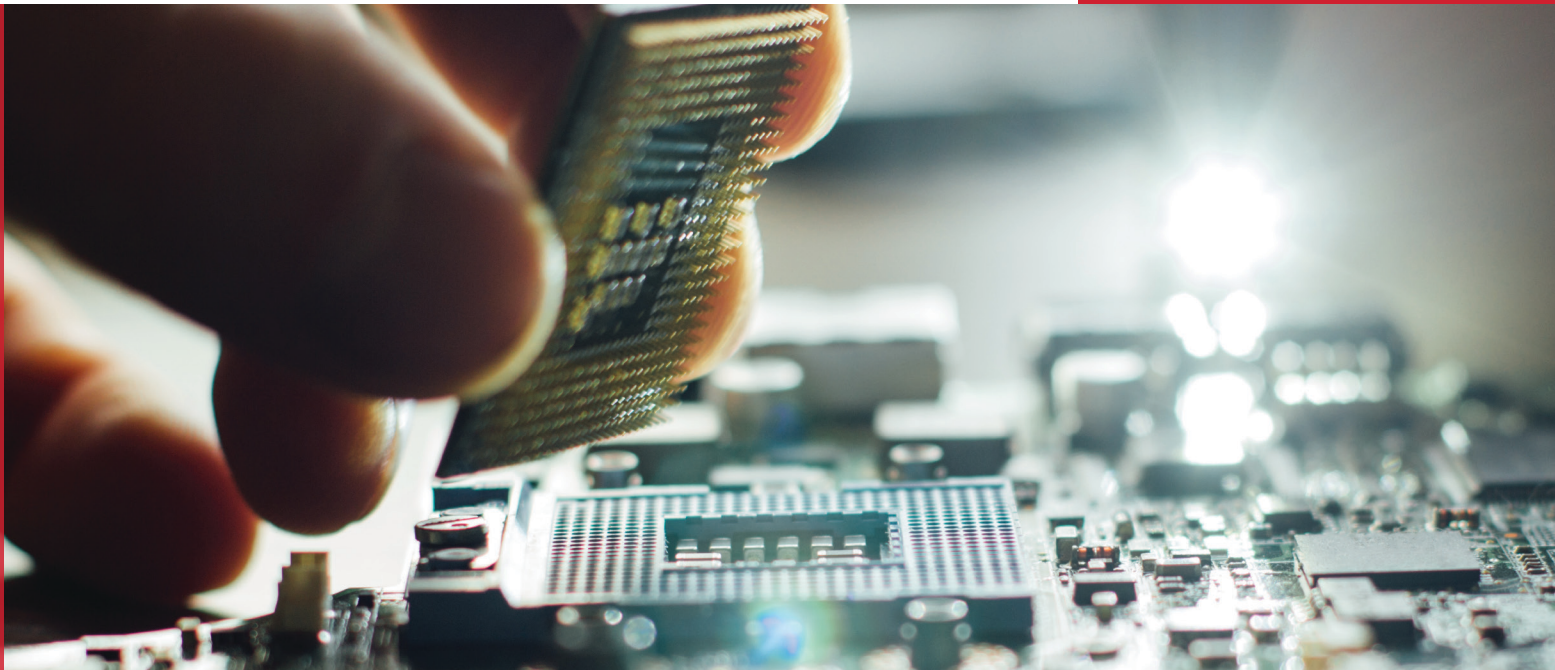




# MacDermid Enthone



## MacuSpec VF

Electrolytic Copper Metallization



**MacDermid Alpha**  
ELECTRONICS SOLUTIONS



[macdermidalpha.com](http://macdermidalpha.com)

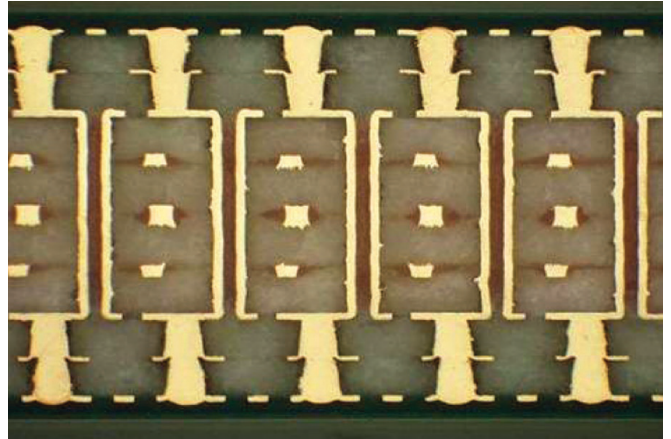
CIRCUITRY SOLUTIONS

# MacuSpec VF

## Electrolytic Copper Metallization

### PTH and Micro Via-Bility in a Single Bath

MacDermid Enthone's **MacuSpec Via Fill Processes** provide fabricators solutions to fit every application in the HDI market, backed by robust design and manufacturing methods, to give the most stable and consistent via filling in the market today.



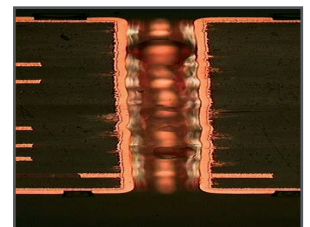
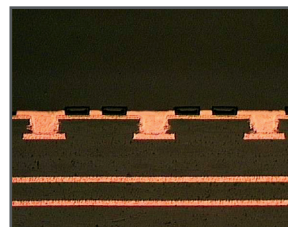
### KEY FEATURES

- Optimized to run in any plating line and anode configuration available
- The versatility to achieve panel, pattern and button plate all in one process
- Minimizes surface copper deposition for Any-layer HDI designs
- Meets IPC specifications
- Reliable thermal cycling performance
- Complete process control by CVS and common analytical tools

### MacuSpec VF Series

**MacuSpec VF Series** offers the most effective processes to fill vias while simultaneously plating through holes with good throwing power and no knee thinning. The MacuSpec VF 100 is designed for air or eductor agitated vertical tanks with soluble anodes. The MacuSpec VF 200 is designed for VCP style tanks with side eductors and soluble anodes. The MacuSpec VF 300 is designed for VCP style tanks with insoluble anodes.

Production proven on a global scale, the VF Series produces IPC 6012 DS Class 3A deposits with Tensile and Elongation values of not less than 40,000psi and 18%, respectively, in panel, pattern, and button plating formats.



Sample	Break Force (lbf)	Weight (g)	Elongation (%)	Tensile Strength (PSI)	Approximate Thickness (mils)
1	58.67	0.9959	22.21	43,007.95	2.89
2	53.14	0.9150	18.43	42,394.01	2.65
3	51.54	0.8944	20.75	42,068.98	2.59
4	51.46	0.8993	20.53	41,769.62	2.61
5	48.27	0.8406	19.27	41,918.09	2.44
Mean	52.62	0.9090	20.24	42,231.73	2.64

# MacuSpec VF

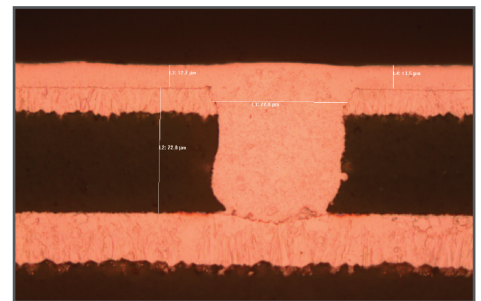
## Electrolytic Copper Metallization

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### MacuSpec AVF Series

**MacuSpec AVF Series** is an excellent choice for Any-layer HDI applications requiring complete filling of a wide range of via diameters with minimal surface copper to avoid planarization or copper thinning before etching. With the AVF series, stacked via designs are easier to produce than ever before.

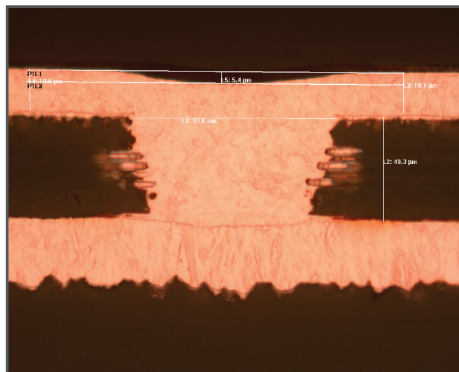
The MacuSpec AVF 700 is the newest technology providing superior filling capability and maximum surface copper suppression in a pre-dip free system for huge savings on operating costs. Combining AVF 700 with a direct metallization solution such as Eclipse or Shadow creates a streamlined flash-plate free process which greatly increases yields and reliability.



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### MacuSpec VF-TH Series

**MacuSpec VF-TH Series** meets the demands for simultaneous via filling and through hole plating. MacuSpec VF-TH Series provides superior via filling with throwing powers of 80-90% on 6:1 aspect ratio holes on boards up to 0.8mm thick with no knee thinning. Designed for use in VCP style tanks in panel or pattern plating modes, the VF-TH Series electrolytic copper metallization has all the advantages of our VF Series baths without the requirements of pre-dip or flash plating process steps.



# MacuSpec VF

## Electrolytic Copper Metallization

### **Wider Operating Window. Greater Versatility. Lower Total Cost. Proven Effective.**

Increase production efficiencies and reduce total costs with MacuSpec VF Series, the electrolytic copper metallization solution that is used by many of the world's largest electronics manufacturers to metallize the features of today and tomorrow. It produces a bright, fine-grained, ductile deposit with excellent physical properties while increasing bath life 400%. Supported by MacDermid Enthone's renowned hands-on global technical service, MacuSpec VF Series does it all for less.

### **MacuSpec VF Series Reliability**

Reliability Test	Conditions	Results
Thermal Stress	IPC TM-650 2.6.8 (6x 10 second solder float @288°C)	PASS
Interconnect Stress testing	IPC TM-650 2.6.26 (6x precondition @ 260°C , ambient to 190°C ,1000 cycles)	PASS
Thermal Cycle Test	IPC -6012C class 3 (-40°C to 140°C, 1000 cycles)	PASS



macdermidalpha.com  
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MacDermid Enthone is a product brand of MacDermid Alpha Electronics Solutions.