

Semcon[®] 1000

Advanced Electroplating Tool



TECHNIC

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Semiconductor Electroplating Tool for R&D and Low Volume Applications

As advanced packaging continues to develop, the implementation of precise electroplating capabilities is playing an ever-increasing role. Often, the first step in implementing electroplating capability is to install a low volume tool to gain experience with how to precisely manage chemical processing. Tools such as these can help optimize process steps to achieve the desired plating results needed for specific packaging.

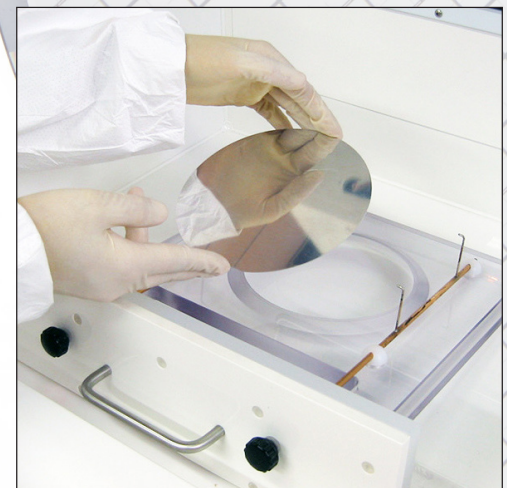
Technic's Semcon 1000 is a manual electroplating tool designed specifically for research & development and low volume production applications. Technic has implemented numerous Semcon tools around the world for many different metal plating solutions and several different applications.

The Semcon 1000 is easy to operate and has been used extensively for copper, nickel, and gold plating. Its universal design allows for use with any commercially available electroplating solution and it can be specially designed to meet class 1000 cleanroom specifications.



Features

- Capable of processing several different (plating) applications
- Processes a variety of substrates including Si, GaAs, InP and more
- Able to plate wafers up to 200mm (square or rectangular panels may be used with customized holders)
- Self-contained with all components required for electroplating
 - Includes single plating cell and drag-out rinse cell
 - DC power supply
 - Pump and Filter
 - Heating and temperature controls
 - Plating rack



Benefits

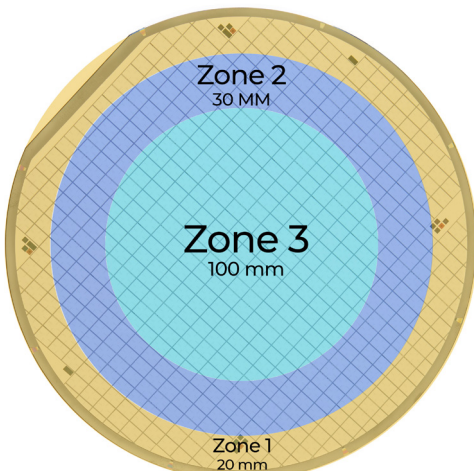
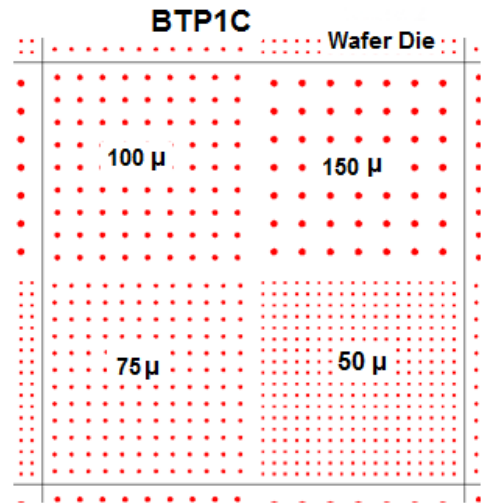
- Provides a low-cost R&D tool for process parameter development that can transfer to mass production operations
- Easy to operate tool to process incremental expansion of plating capabilities from a single metal to multiple metal stacks.
- Ongoing technical support with industry leading chemistry - Technic supplies a wide range of advanced electroplating chemistries - providing for the quick development of optimum process parameters

Copper Plating Data

Wafer Size: 200 mm
 CD: 100 ASF
 Features sizes: 50 and 150 μm pillars
 Target thickness: 50 microns

The pattern on the wafer is composed of dies, which contain round features with 50, 75, 100 & 150 μm diameters. 50 and 150 micron features were used for comparison data to show extreme conditions.

The image to the right shows the layout of the die.



	Zone 1			Zone 2			Zone 3	
	150 μm	50 μm		150 μm	50 μm		150 μm	50 μm
	40.3	43.2		46.4	48.4		44.1	46.7
	41.9	41.4		45.0	46.1		43.8	46.6
	41.5	41.7		43.1	46.0		44.0	46.5
	41.9	41.8		44.0	46.9		43.3	46.2
	41.3	41.7		42.9	45.2		43.0	45.8
	42.0	40.8		43.7	46.1		42.7	43.0
	42.2	40.6		42.9	45.6		42.7	45.9
	43.8	44.1		44.0	45.7		42.6	45.8
	39.5	41.1		43.8	45.2		42.4	45.7
	42.8	44.4		42.0	45.2		42.0	45.6
	42.9	44.1		43.7	46.2		42.0	46.4
	46.0	47.1		45.4	48.1		44.2	47.0
avg.	42.2	42.7	avg.	43.9	46.2	avg.	43.1	45.9
max	46.0	47.1	max	46.4	48.4	max	44.2	47.0
min	39.5	40.6	min	42.0	45.2	min	42.0	43.0
COP, %	7.7	7.6	COP, %	5.0	3.5	COP, %	2.6	4.4

Additional optimization of the coplanarity across the wafer may be achieved through cathodic shielding, adjustments to the electroplating operating parameters and other methods.

SEMCON[®] 1000 Specifications

Wafer Size Capability	Single wafer, up to 200mm diameter (Square/rectangular holders optional)
Plating Cell Construction	Polypropylene (FM-4910 material specifications optional)
Filtration	Polypropylene Pump/Filter 10" DOE 1 micron pleated filter element On/Off control with potentiometer speed control
Heating	Electric immersion (1000 watts) Up to 70°C capacity, Digital display control
DC Power Supply	Straight DC (Pulsed output option available)
Anodes	Insoluble platinum-clad mesh anodes (Soluble anodes option available) Adjustable anode-cathode distance
DI Water Consumption	2 GPM (Maximum) at 30 PSI
Ventilation (Exhaust)	100 CFM at 2" water column
Power	208 VAC, single phase, 60hz, 15 amperes
Overall Size	30" L x 40" W x 49" H