

Semcon[®] Fountain

Advanced Electroplating Tool



www.technic.com

Patented New Semiconductor Electroplating Tool for R&D and Low Volume Applications

The Semcon Fountain is the latest development in the highly successful Semcon series of wafer plating tools by Technic. Expanding on the popularity of the Semcon 1000 single wafer processing for R&D and small scale production, the Semcon Fountain offers more options and features with a patented chamber design and solution sparger that more closely resembles a full-scale production environment. The Semcon Fountain's unique design also orients the wafer in the more favorable horizontal position, mimicking most of the semiconductor mass production electroplating tools. The Semcon Fountain is capable of processing wafers up to 300 mm with specially designed wafer mounts.

Through the use of interchangeable wafer plating cups, fabricated to specific wafer sizes. Optimum plating results can be achieved by configuring the process for each application by adjusting the sparger, solution flow, shielding, and more. Each, diameter specific, wafer cup allows for maximum flexibility at a low cost by being able to run different wafer sizes using one plating cell.

The Semcon Fountain is ideal when setting up an electroplating process for the first time or when introducing a new metal plating bath to an already existing electroplating process.

Features

- Can be used for several different applications on a variety of substrates including Si, GaAs, InP and others.
- The horizontal orientation of the wafer allows for ease of transition to a mass production fountain tool.
- Custom plating cups specific to wafer diameter results in optimized plating performance.
- Rotating sparger provides an ideal solution flow across a stabilized wafer.
- Self-contained with all components required for an electroplating system.
- Centralized controls and a touch screen PLC to store plating recipes.

Benefits

- Superior WID and WIW improves development and processing cost by reducing the amount of metal required per wafer. This is extremely beneficial when plating gold or other precious metals.
- Reduced cost of R&D by providing a versatile tool that can be used to develop and test process parameters that can be transferred to mass production tool.
- A self-contained, modular tool allowing for low-cost incremental expansion of plating capabilities from a single metal application to multiple metal stacks.
- Technic supplies a wide range of electroplating chemistries for the quick development of optimum process parameters.



Copper Plating Data

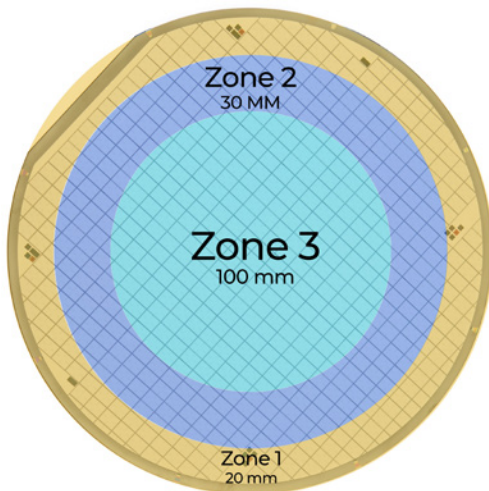
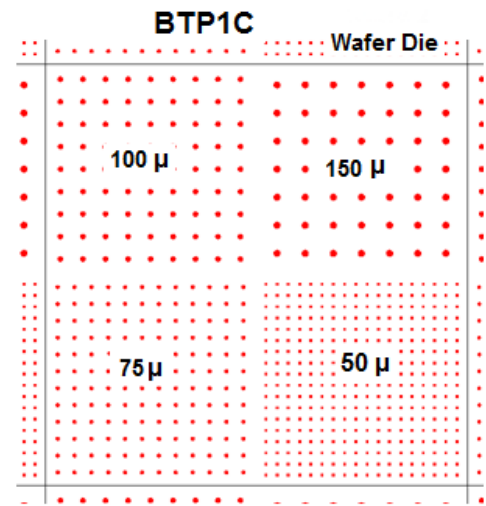
Wafer Size: 200 mm

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
	54.0	51.4	53.0	51.3	52.1	52.0
	54.0	50.9	53.1	51.0	52.6	50.8
	53.7	51.4	53.4	50.9	53.2	51.4
	53.3	51.3	52.4	50.6	51.6	50.4
	55.2	52.2	53.9	51.3	50.3	49.6
	53.3	52.1	52.3	51.3	52.0	50.5
	53.8	52.1	53.1	51.6	50.2	50.0
	50.5	47.3	51.0	49.1	51.7	51.0
	54.6	52.4	51.8	50.6	50.4	50.4
	54.2	51.5	52.2	50.3	52.1	51.8
	53.1	50.9	52.7	50.2	52.1	51.0
avg.	53.6	51.2	52.6	50.7	51.7	50.9
max	55.2	52.4	53.9	51.6	53.2	52.0
min	50.5	47.3	51.0	49.1	50.2	49.6
COP, %	4.4	5.0	2.8	2.5	2.9	2.6

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

SEMCON[®] Fountain Specifications

Wafer Size Capability	100, 150, 200 and 300 mm wafer cups available
Plating Cell Construction	Plating Cell: Polypropylene and CPVC Hardware: Stainless Steel and Titanium Gasket: Silicon
Filtration	Pump: Polypropylene and CPVC wetted parts 10" DOE filter element (1 – 10 micron, customer replaceable) 15 GPM constant flow, closed loop flow control, central PLC process control
Heating	PTFE coated electric immersion, 2 hours heating from ambient to 60°C. (70°C max. temp.) Centralized PLC process control and digital display Optional hot water heating available
DC Power Supply	18 VDC, 20 Amp CC/CV Switch mode
Anodes	Insoluble platinum-clad mesh anodes or Titanium mesh support for soluble anodes
Rinse Station	Optional
DI Water Consumption	2 GPM (maximum) at 30 PSI for optional rinse station
Ventilation (Exhaust)	6" connection, 500 CFM at 2" water column
Power	208 VAC, single phase, 60 hz, 15 amperes
Overall Size	43" L x 30" W x 64" H
Bath Volume	60 liters

