

MesoSPHERE™ Plasma System

Features and Benefits

- Modular design allows capacity increase on a per plasma chamber basis
- EFEM integration supports from 1 to 4 plasma chambers
- Pocket chuck design ensures accurate substrate placement and centering, maximizing process repeatability
- Configurable for wafer, wafer-on-frame, and round/square substrates up to 480mm
- Plasma confinement technology isolates plasma distribution directly above the wafer, minimizing undesired secondary reactions



Superior Plasma Technology for Wafer and Panel Packaging

Whether it is fan-in, fan-out, wafer-level or panel-level, the MesoSPHERE™ system is ideal for very high-throughput processing of wafers or substrates up to 480mm. It includes field-proven plasma chambers along with an innovative handling system that can transfer round or square substrates and frame or bonded carriers.

Built upon the patented F3 symmetrical chamber design, all areas of the substrate are treated equally, ensuring excellent within wafer and wafer-to-wafer uniformity. When equipped with a plasma confinement ring, etch rates can increase up to 25 percent and non-uniformity reduced by up to 50 percent.

The universal architecture of the MesoSPHERE system accommodates a wide range of substrate sizes, simplifying the transition from wafer-level to panel-level advanced packaging. Its small chamber geometry requires minimum hardware change to transition from one substrate size to another. In some cases, it is possible to support two or more substrate sizes with a single configuration.

High-Throughput Processing

The MesoSPHERE system's integrated handling system provides rapid material transfer for a wide range of wafer, carrier and panel sizes. Processing can be done on standard, warped, bonded, or thin wafers/panels (with and without frames), in most types of cassettes.

Production-ready end-effectors support vacuum, backside or edge-grip transfer. End effectors connect to a dual-arm, 3-axis transversal robot for efficient substrate handling.

The proprietary chamber design and control architecture enables short plasma cycle times with very low overhead, ensuring that throughput for your application is maximized and cost of ownership is minimized.

Plasma Treatment

- Remove organic and inorganic contamination
- Passive metallic surfaces to minimize oxidation
- Remove adhesive residue after debonding
- Sputter metal and metallic oxides
- Improve spun-on film adhesion
- Clean metallic bond pads

Plasma Etching

- Descum wafer of residual photoresist / BCB
- Pattern dielectric layers for redistribution
- Strip photoresist
- Enhance adhesion of wafer applied materials
- Remove excess wafer applied mold or epoxy
- Enhance adhesion of gold solder bumps
- Destress wafer to reduce breakage
- Clean Aluminum bond pads



Specifications: MesoSPHERE™ Plasma System

Enclosure Dimensions	W x D x H – Footprint: Single Chamber w/ EFEM Dual Chamber w/ EFEM Quad Chamber w/ EFEM	1480W x 2700D x 2190H mm (58W x 106D x 86H in) 1480W x 2700D x 2190H mm (58W x 106D x 86H in) 2695W x 2700D x 2190H mm (106W x 106D x 86H in)
	Net Weight: Process Module EFEM	725 kg (1600 lbs) 860 kg (1900 lbs)
	Effective Footprint – Clearances	Left/Right – 775 mm (30 in.), Front – 153 mm (6 in.), Back – 380 mm (15 in.)
Chamber	Maximum Volume	11.7 liters (715 in ³)
	Chuck Configurations	Round or square wafer/substrate up to 480mm
Electrodes	Variable Electrode Configurations	Power-Ground, Ground-Power, Power-Power
	Working Area	480 x 480 x 50 mm (19 x 19 x 2.0 in.) (L x W x H)
RF Power	Standard Wattage	1000 W
	Frequency	13.56 MHz
Gas Control	Available Flow Volumes	10, 25, 50, 100, 250 or 500 sccm
	Maximum Number of MFCs	4
Control & Interface	Software Control	EPC with PC-Based Touch Screen Interface
	Remote Interface	SMEMA, SECS/GEM
Vacuum Pump	Standard Dry Pump	22 cfm
	Optional Purged Dry Pump	22 cfm
	N2 Purged Pump Flow	2 slm
Facilities	Power Supply	220 VAC, 20A, 50/60 Hz, 1-Phase, 12 AWG, 3-Wire
	Process Gas Fitting Size & Type	6.35 mm (0.25 in.) OD Swagelok Tube
	Process Gas Purity	Lab or Electronic Grade
	Process Gas Pressure	0.69 bar (10 psig) min. to 1.03 bar (15 psig) max., regulated
	Purge Gas Fitting Size & Type	6.35 mm (0.25 in.) OD Swagelok Tube
	Purge Gas Purity	Lab or Electronic Grade N2/CDA
	Purge Gas Pressure	2 bar (30 psig) min. to 6.9 bar (100 psig) max., regulated
	Pneumatic Valves Fitting Size & Type	6.35 mm (0.25 in.) OD Swagelok Tube
	Pneumatic Gas Purity	CDA, Oil Free, Dewpoint ≤7°C (45°F), Particulate Size <5 μm
	Pneumatic Gas Pressure	5.5 bar (80 psig) min. to 6.89 bar (100 psig) max., regulated
Compliance	SEMI	S2/S8 (EH&S/Ergonomics)
	International	CE Marked
Ancillary Equipment	Gas Generators	Nitrogen, Hydrogen (Requires Additional Non-Optional Hardware)
	Facilities	Chiller

For more information, speak with your local representative or contact your regional office.

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