

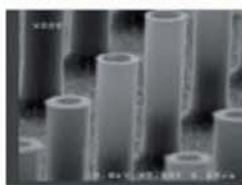
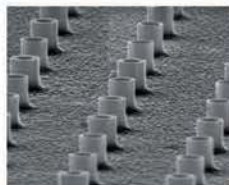
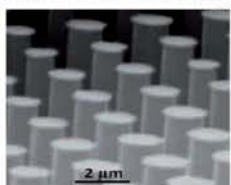
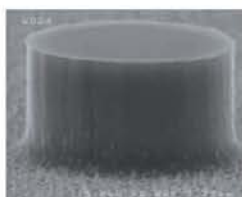
Deep Reactive Ion Etching (DRIE)

"SI-HV300" is a Deep Reactive Ion Etching (DRIE) machine, with capability of making vertical structures on silicon substrates. This machine uses a patented novel deep etching process which can make very fine vertical structures. The aspect ratio of structures can be as high as 50:1, while the dimensions can be as low as 100 nm. The DRIE process uses a mixture of 3 gases, H_2 , O_2 and SF_6 in a time multiplex technique with two successive steps: Etching and Passivation. The process is performing in room temperature. The whole process is controlled automatically using a computer. This machine can also be used for conventional RIE processes, such as plasma etching or ashing.

DRIE is a highly anisotropic etch process used to create deep penetration, steep-sided holes and trenches in wafers/substrates, typically with high aspect ratios.

Specifications

Model	DRIE(SI-HV300)	
Process chamber	Process Range	Room Temperature
	Base Pressure	80 MilliTorr
	Chamber Type & Size	360x380x300 mm, 20 liter volume, Aluminum
Substrate Holder	Substrate Sizes	4 inch Wafer Size Capability
	Holder Material	Aluminum
Gas Module	Gas Distribution	Shower Head, MFC's, SS lines Gas Ring, Up to 6 Gas Line
Pumping System	Vacuum Pumping Systems	Two stage Rotary vane pump
	Mechanical Pump Capacity	10 mTorr
Control Module	Industrial PC/PLC	User Friendly windows7 Operator Interface
Connection systems	Water Connection	1/8 inch pipe
	Air Connection	6 mm pneumatic
	Exhaust	30 mm
Physical Dimensions	Main Frame	H1000 x D 900 x W1000 mm
	Total Weight	200 kg
	Outer Casing Material	Iron
Power	Power	5 KW- 3 Phase- 110/220 V- 20/40 A
	Plasma Source RF	300W/13.56 MHz
	RF Power	300 W
Plasma Etch Mode	RF Gas distribution plate for Isotropic etching	capable of switching from plasma to RIE mode during process
Process Gases	SF6 or CF4	Flow Rate : 0-200 sccm
	O2 , H2, N2	Flow Rate : 0-500 sccm
Applications	Electronic & Microelectromechanical systems (MEMS) Used to excavate trenches for high-density capacitors for DRAM Recently for creating through silicon via's (TSV)'s in advanced 3D wafer level packaging technology.	



FESEM Images of Micro and Nano Structures Etched by DRIE(SI-HV300)

