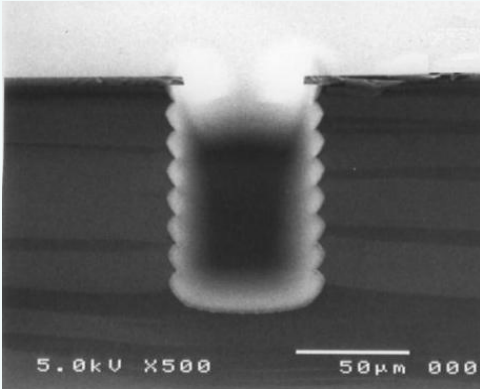


High-speed *Si* Deep Etching System

MODEL **RIE-800iPB**

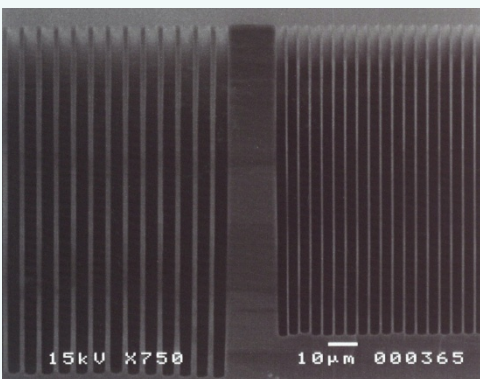
Examples of Etching Process

—High Rate Etching—



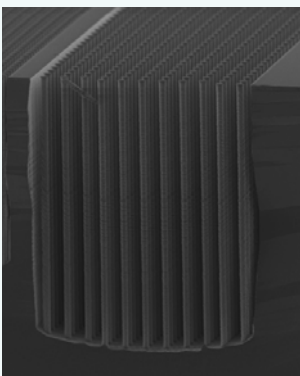
Etch Rate: 55 μ m/min
Pattern Width: 50 μ m
Etch Depth: 103 μ m

—High Aspect Etching—



Etch Rate: 1.6 μ m/min
Aspect Ratio: 30
Etch Depth: 100 μ m

—Pillar Pattern—



Etch Rate: 12 μ m/min
Pillar Diameter: ϕ 6 μ m
Pillar Height: 265 μ m



Licensed from Robert Bosch GmbH of Germany.

The SAMCO RIE-800iPB is an inductively coupled plasma RIE system that uses high-density plasma to perform high-speed deep silicon etching required for the fabrication of MEMS devices.

The system, based on the field-proven Tornado ICP® technology, was developed using the patents licensed from Robert Bosch GmbH of Germany. The RIE-800iPB was specially designed for the Bosch Process to achieve superior performance for high-speed deep vertical etching of silicon.

Designed Specifically for High Rate Bosch Process

Features

- High speed Si deep etching is made possible using the original plasma source and the chamber structure suited for high speed Bosch process.
- Wafer through hole etching (depth 600 μm)
- Scallop is reduced by high speed gas switching.
- Options
 - Notch prevention for etching SOI substrates.
 - Wafer size : max. 8 inch

Applications

- Manufacturing of acceleration sensors, gyro sensors, actuators etc.
- Manufacturing of ink jet printer heads.
- Via holes formation for 3D Packaging.
- Manufacturing of medical devices (μTAS, etc.).

System Specifications

Reaction Chamber	Aluminum, φ440mm
Sample Stage	Aluminum, φ208mm
Loadlock Chamber	Aluminum, 340×445mm
Sample Transfer	Linear motion vacuum robot
ICP Power	13.56 MHz, 3kW, crystal oscillation, automatching
Bias RF power	13.56 MHz, 500W, crystal oscillation, automatching
Vacuum System	Reaction chamber : Turbomolecular pump + Dry pump, Automatic pressure control Loadlock chamber : Dry pump
Vacuum Gauges	Reaction chamber : Ionization gauge (13~10 ⁻⁶ Pa) + Diaphragm gauge (33.3~3.33×10 ⁻³ Pa) Loadlock chamber : Crystal gauge (10 ⁵ ×10 ⁻² Pa)
Gas Lines	6 Mass flow controlled lines (including 1 MFC as spare)
Dimensions	1000 (W)×1700 (D)×1800 (H) mm

Options

Notch prevention using pulse

Exhaust gas treatment unit

▲Please contact SAMCO for details regarding other options.

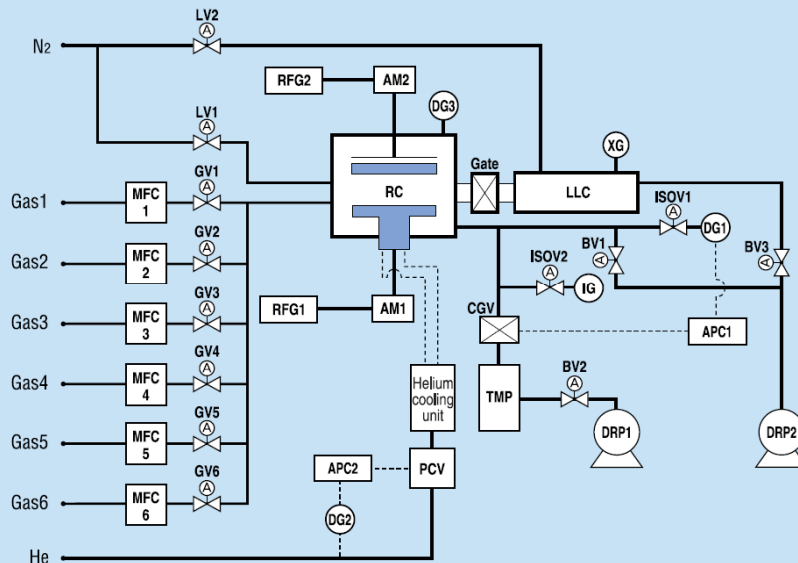
Utility Requirements

Power	AC200V, 3φ 60A
Ground	Type D ground
Cooling Water	Above 8ℓ /min for main system Above 3ℓ /min × 2 for the dry pumps
Exhaust Ducts	for the dry pumps
Compressed Air	0.5~0.7MPa (G)
N ₂	0.1MPa (G) for venting LLC and reaction chamber 0.2~1.0MPa (G) for the dry pumps

Flow Sheet

Guide to acronyms in the flow sheet

- MFC 1~6 Mass flow controller
- GV 1~6 Gas valve
- LV 1~2 Leak valve
- BV 1~3 Vacuum valve
- CGV Control gate valve
- ISOV 1~2 Isolation valve
- XG Crystal gauge
- IG Ionization gauge
- DG 1~3 Diaphragm gauge
- TMP Turbomolecular pump
- DRP 1~2 Dry pump
- AM 1~2 Automatching unit
- RFG 1~2 RF generator
- RC Reaction chamber
- LLC Loadlock chamber
- APC 1~2 Automatic pressure controller



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