High Precision ICP Etching System

RIE-110iP

FEATURES

- Ability to process up to 4" wafers
- SAMCO's Tornado Coil Type C allows for high uniformity, high selectivity, and low plasma damage
- Pendulum vacuum control system maintains high vacuum at high gas flows and accurately controls pressure at low gas flows
- Optimized chamber design with heating for reduced polymer formation and greater repeatability
- ICP source can be modified with source specialized for SiO_2 etching
- Dielectric etching kit option allows for high selectivity, high rate SiO_2 and SiC etching
- Transfer trays for chip and small sample processing
- Easy to maintain

APPLICATIONS

- Si photonics
- III-V compound semiconductor etching
- SiO_2 and SiC etching

SAMCO's RIE-110iP™ is an inductively coupled, reactive ion etching system capable of highly precise etching. The system was specially designed for R&D customers requiring performance, versatility, and value.

Leveraging SAMCO's 3rd Generation Tornado Coil, the system offers the most advanced Si and III-V compound semiconductor etching and provides precision profile, smoothness, depth and etch stop control.

When configured with the Dielectric Etching Module, the RIE-110iP can perform high selectivity, high rate etching of SiO_2 and SiC materials.

SPECIFICATIONS

PROCESS CHAMBER
- Aluminum, 320mm inner diameter, 37mm viewport (right side of chamber), 2 auxiliary ports port for end point detection
- Rubber heater (max. 60°C)

LOADLOCK CHAMBER
- Aluminum, 340(W) x 445(D) x 144(H) (mm)
- Automatic opening/closing of LL chamber lid
- Rectangular gate valve
- Automated sample transfer
- Direct sample transfer under vacuum

ELECTRODES

ICP Electrode:
- Tornado Coil Type C for precision processing

Lower Electrode:
- Aluminum 106mm diameter
- Alumina anti-sputter cover
- Electrostatic chuck for 4" wafers
- Helium backside cooling

RF POWER

ICP Electrode:
- 13.56 MHz, Max. 1kW, crystal oscillator
- Automatic matching

Lower Electrode:
- 13.56 MHz, Max. 300W, crystal oscillator
- Automatic matching

VACUUM SYSTEM

Process Vacuum Line:
- Chemical series, compound turbo molecular pump, 1300 liters/second
- Backed by a dry pump, 1000 liters/min.

Loadlock Chamber:
- Same dry pump used for TMP backing
- Pendulum control gate valve with variable conductance (connected to diaphragm gauge)

PRESSURE MEASUREMENT AND CONTROL

Process Chamber:
- Diaphragm gauge ($1.33x10^{1}$ to $1.33x10^{-3}$ Pa)
- Diaphragm gauge ($1.33x10^{3}$ to $1.33x10^{-1}$ Pa)
- Ionization gauge ($1.3x10^{-1}$ to $1x10^{-5}$ Pa)

Loadlock Chamber:
- Crystal gauge (Atmospheric to 10^{-2} Pa)

GAS INLET LINES
- 4 mass flow controllers standard (6 MFCs max.)

SYSTEM OPERATION
- Fully automatic "one button" or completely manual operation
- Safety interlocks
- Touch panel display
- Recipe storage (max. 100 recipes total)
- Multi-step processing (10 steps per recipe)
- Cycle purge
- Data logging function

FACILITY REQUIREMENTS

Power:	200 VAC, 3 phase, 60 A
Ground:	Type D ground
Process Gases:	0.1 MPa, 1/4" VCR fittings x 4
Nitrogen Supply (1/4" SWL x 1) for:	
Chamber Purge:	0.1 MPa, 40 l/min., including loadlock chamber (20 l/min.)
Dry Pump Purge:	0.1-0.7 MPa, Max. 30 l/min.
Helium:	0.1 MPa, 1/4" VCR fittings x 1
Compressed Air:	0.5-0.7 MPa (1/4" SWL x 1)
Cooling water:	
Main Unit:	<0.3 MPa, more than 2 l/min.
Dry Pump:	0.2-0.5 MPa, >4-8 l/min.
Exhaust Duct:	NW40 x 1
Duct Connection:	Ø150mm x 100mm (L), main unit

DIMENSIONS (W x D x H)

Main Unit:	986 x 1792 x 1883 (mm)
Pump Unit:	370 x 690 x 551 (mm)
Chiller:	354 x 384 x 910 (mm)

Specifications subject to change without notice

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