Compact Reactive Ion Etching System

RIE-1C

SAMCO’s RIE-1C™ is the ideal solution for laboratories with planar ion-assisted etching requirements and very little bench-top space. This high-performance system is engineered to optimize etching rates, uniformity and selectivity and is especially well suited for removing passivation materials for failure analysis.

The RIE-1C is a fluorine-based etching system that can also be used for etching silicon based films, refractory metals, metal silicides, and spin-on-glass. Once a recipe is set up, complete substrate/device processing is started with a push of a button, including system pumpdown, initiation of gas flow, RF power and chamber venting. In addition, the RIE-1C includes a door interlock and reset switch to ensure operator safety and protect the system. A small-footprint cart designed to hold the RIE-1C, RF power generator and vacuum pump is included with the system.

FEATURES

• "One button" operation after set up of process recipe
• Accomodates one 4” wafer or multiple die or packaged devices
• Audio alarm signals completion of run
• Safety features protect system and operator
• Sleek, compact design
• Small-footprint cart saves benchtop space

APPLICATIONS

• Stripping of passivation materials including silicon nitride, silicon dioxide, and polyimide
• Etching of intermetal dielectric with profile control
• Removal of residual encapsulation material on ICs for failure analysis
• Stripping of photoresist and polyimide
• Etching silicon, polysilicon, refractory metals, metal silicides, spin-on-glass, etc.
## Specifications

**Reactor**
- Quartz, 210 mm diameter, 62 mm height
- Viewing port on front panel

**Parallel-Plate Electrodes**
- **Upper Electrode**
  - Aluminum, 140 mm diameter, shower head
- **Lower Electrode**
  - Aluminum, 120 mm diameter, liquid cooled
  - 13.56 MHz, 0-200W solid state generator

**RF Power**
- Digital readout of forward and reflected power

**Vacuum System**
- Chemical series, 2-stage rotary pump, 300 liters/min., with flow meter for nitrogen purged gas ballast

**Pressure Measurement**
- Pirani Gauge, $1 \times 10^4$ to $1.3 \times 10^{-1}$ Pa

**Gas Inlet Lines**
- Two rotameters for CF₄ and oxygen, 5-50 SCCM
  (other gas calibrations available upon request)
- One nitrogen purge line

**Process Timer**
- Digital (0.1 second resolution)

**Audio Alarm**
- Alerts operator when process is finished

**Operation**
- Sequence controller for automatic operation of vacuum system, gas valves, and RF power

**Safety Features**
- Door interlock system is inoperable when reactor door is open
- Reset switch for immediate process halt, evacuation of process gases, and chamber vent

**Utilities Requirements**
- **Power Required:**
  - 115 VAC, 60 Hz, 20 A
  - Cooling Water:
    - 0.2-0.3 MPa, 2-3 liters/min.
  - Process Gases:
    - 0.1 MPa
      - Nitrogen: 0.1 MPa, 10 liters/min.
      - Venting:
        - Exhaust duct for rotary pump, NW25

**Dimensions (WxDxH) (mm)**
- Main Unit: 400 x 440 x 325
- Pump Unit: 162 x 453 x 230
- System Stand: 400 x 620 x 800

**Options**
- Capacitance manometer with digital display
- Flow meter gas calibration change
- DC bias measurement circuit
- Pump upgrade (413 liters/min.)

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