Corial 200RL

- RIE Reactor
- Load-lock for 200 mm wafers
- Laser Endpoint Detector
Compact RIE System

- Gate valve for quick reactor venting and cleaning
- Penning gauge
- Gas Box
- Power Supplies
- Dry Pump ADP 122 (95 m³/h)
Reactor Features

- **Reactive Ion Etching** source designed to operate with a wide working pressure range (1 to 400 mT),
- **The large cathode size** enables etching of up to 200 mm wafers,
- **Shuttles** for loading and to enable etching of different sizes and numbers of wafers,
- **Helium assisted heat exchange** between cathode, shuttle and wafers with mechanical clamping to maintain sample temperature below 100°C during etching at high RF power.
Benefits of Shuttles

- Quick change of sample shape and size,
- Optimum process conditions with NO modification of process chamber,
- Less cross contamination between processes when a shuttle is dedicated to a given process.
**ALUMINUM ETCHING**

- **Aluminum etching requirements:**
  - High etch rates and anisotropic profiles,
  - Aluminum etch rate: 250 nm/min,
  - After the aluminum etching phase, a passivation step avoids corrosion due to AlCl$_3$ trapped on the side walls during aluminum etching,
  - No damage after a week long moisture exposure test at atmospheric pressure.
ALUMINUM ETCHING RESULTS

High resolution aluminum etching with **no post etch Al corrosion**

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End of electrode for a 1600 Å thick technology.

(Magnification is **600X**)

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Aluminum etched with photoresist mask (Spaces = 0.5 µm)

(Magnification is **20,000X**)

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RIE of Al and Al/2%Cu

Clean Al etch

Etching of Al/2%Cu on Al
**Process Specifications**

**For Aluminum Etching**

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>Etch Rate (nm/min)</th>
<th>Uniformity of Etch Rate</th>
<th>Selectivity against PR</th>
<th>Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIE of Al with PR mask</td>
<td>250</td>
<td>±5%</td>
<td>2.5</td>
<td>85° to 90°</td>
</tr>
<tr>
<td>RIE of Al/2%Cu with PR mask</td>
<td>200</td>
<td>±5%</td>
<td>2</td>
<td>85° to 90°</td>
</tr>
</tbody>
</table>

**Guaranteed Process Results**
Chlorine Based Etching

RIE of GaAs

Anisotropic RIE etching of GaAs

ICP etching of Al

Resist mask
Mirror structure
InGaAs
GaAs Buffer

VCSEL

Anisotropic RIE etching of GaAs
Halocarbon & Chlorine

ICP etching of GaN

RIE of InP 0.1 µm lines and spaces

RIE of InGaAsP

10 µm deep RIE etching in InP

ICP etching of InP
A Communicant tool

- Maintenance PC
  - Corial Site
- Internet, WAN, ADSL, VPN
- Customer PCs
  - Other Sites
- Customer Firewall
- LAN
- System PC
- Corial System