AX5010-INT Microwave Plasma CVD System

The AX5010-INT Microwave Plasma CVD System is used for growth of high quality diamond films and is designed as a low cost entry system for basic film research in R&D laboratories. It produces a wide range of polycrystalline and single crystal diamond films on a variety of substrates with properties equal to or better than those made by any other method. The AX5010-INT is easy to use, small in size, and gives reproducible results.

The AX5010-INT is an integrated system (pictured on the left), is delivered as a complete, diamond growth process tested system including: 1.5kW microwave power generator, waveguide components, quartz bell jar chamber, substrate stage, air cooling blower, 3 gas channels and vacuum pump. As a lower cost option (center picture), the AX5010 Reactor Kit, is also available as a reactor only requiring user provided integration of vacuum and gas delivery components to complete the working system.

**Diamond Film Synthesis Applications**

- Microcrystalline
- Nanocrystalline
- Homoepitaxy
- Doped Films
- Hydrogenation
AX5010-INT Microwave Plasma CVD System Specification

-- Vacuum System & Reactor Chamber

- Typical Operating Pressure range: 1.3-6.7kPa (10–50Torr)
- Pump Speed: 5.6 x 10^-8 m³/sec (20 m³/hr) @ 50Hz
- Maximum Gas Load: 3.4 Pa m³/sec (2 slm)
- Base Pressure: 10 Pa (7.5 x 10^-2 Torr)
- Vacuum leak integrity: Less than 8.0 x 10^-8 Pa m³/sec (6.0 x 10^-7 Torr1/sec)
- Vacuum pump type: Oil rotary pump
- Reactor chamber: Quartz bell jar
- Vacuum seals: Elastomer O-rings
- Cooling: Forced air blower
- Process area: 1” diameter uniform deposition for typical polycrystalline film growth process

-- Microwave Generator

- Microwave Output Power: Variable from 125W up to 1.5kW @2.45 GHz, Input power is 208 VAC, 3phase, 50/60Hz at 20A
- Impedance matching: Three stub tuner for plasma impedance matching
- Protection Interlocks: Water cooling loop flow MW Reflected power

-- Substrate Stage

- Stage Type: Mo plate (unheated/uncooled)
- Substrate Stage Size: 3.1” diameter
- Substrate Holder: 1” diameter center indentation to position the substrate
- Deposition Area: 1” with good uniformity

-- Process Gas

<table>
<thead>
<tr>
<th>Channel #</th>
<th>Volume Flow Range</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>1000 sccm</td>
<td>Hydrogen (H₂)</td>
</tr>
<tr>
<td># 2</td>
<td>20 sccm</td>
<td>Methane (CH₄)</td>
</tr>
<tr>
<td># 3</td>
<td>10 sccm</td>
<td>Nitrogen (N₂)</td>
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</tbody>
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