



KINTEK SOLUTION

## Lab Grown Diamond Machine Catalog

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# KINTEK SOLUTION

## COMPANY PROFILE

### >>> About Us

Kintek Solution Ltd is one technology orientated organization, team members are devoted to probing the most efficient and reliable technology and innovations in the scientific researching equipment, fields like biochemical reacting, new materials researching, heat treatment, vacuum creating, refrigerating, as well as pharmaceutical and petroleum extracting equipment.

In the past 20 years, we earned rich experiences in this researching equipment field, we are capable to supply both the equipment and solution according to customer's needs and realities, we have also developed lots of customer tailored equipment according to a specific working purpose, and we have lots of successful projects in many universities and institutes from different countries, like Asia, Europe, North and South America, Australia and New Zealand, Middle East, and Africa.

Profession, quick response, hard working, and sincerity is a remarkable label of our team members working attitude, which earn us a sound reputation among our clients.

We are here and ready to service our clients from different countries and regions, and share the most efficient and reliable technology together!



# Cylindrical Resonator Mpcvd Diamond Machine For Lab Diamond Growth

Item Number: KTWB315



## Introduction

Learn about Cylindrical Resonator MPCVD Machine, the microwave plasma chemical vapor deposition method used for growing diamond gemstones and films in the jewelry and semi-conductor industries. Discover its cost-effective advantages over traditional HPHT methods.

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Microwave system	<ul style="list-style-type: none"> <li>• Microwave frequency 2450±15MHZ,</li> <li>• Output power 1~10 KW continuously adjustable</li> <li>• Microwave output power stability:</li> <li>• Microwave leakage ≤2MW/cm<sup>2</sup></li> <li>• Output wave guide interface: WR340, 430 with FD-340, 430 standard flange</li> <li>• Cooling water flow: 6-12L/min</li> <li>• System standing wave coefficient: VSWR ≤ 1.5</li> <li>• Microwave manual 3 pin adjuster, excitation cavity, high-power load</li> <li>• Input power supply: 380VAC/50Hz ± 10%, three-phase</li> </ul>
Reaction chamber	<ul style="list-style-type: none"> <li>• Vacuum leakage rate</li> <li>• The limit pressure is less than 0.7 Pa(Standard setup with Pirani vacuum gauge)</li> <li>• The pressure rise of chamber shall not exceed 50Pa after 12 hours of pressure maintaining</li> <li>• Working mode of reaction chamber: TM021 or TM023 mode</li> <li>• Cavity type: Cylindrical resonant cavity, with maximum bearing power of 10KW, made of 304 stainless steel, with water-cooled inter-layer, and high purity quartz plate sealing method.</li> <li>• Air intake mode: Top annular uniform air intake</li> <li>• Vacuum sealing: The bottom connection of the main chamber and the injection door are sealed with rubber rings, the vacuum pump and bellows are sealed with KF, the quartz plate is sealed with a metal C-ring, and the rest are sealed with CF</li> <li>• Observation and temperature measurement window: 8 observation port</li> <li>• Sample load port in front of chamber</li> <li>• Stable discharge within the pressure range of 0.7KPa~30KPa (the power pressure shall be matched)</li> </ul>
Sample holder	<ul style="list-style-type: none"> <li>• Diameter of sample table≥72mm, effective use area≥66 mm</li> <li>• Base plate platform water-cooled sandwich structure</li> <li>• Sample holder can be lifted and lowered evenly electrically in the cavity</li> </ul>
Gas flow system	<ul style="list-style-type: none"> <li>• All metal welding air disk</li> <li>• Welding or VCR joints shall be used for all internal gas circuits of the equipment.</li> <li>• 5 channels MFC flow meter, H<sub>2</sub>/CH<sub>4</sub>/O<sub>2</sub>/N<sub>2</sub>/Ar. H<sub>2</sub>: 1000 sccm ;CH<sub>4</sub>:100 sccm; O<sub>2</sub>: 2 sccm; N<sub>2</sub>: 2 sccm; Ar: 10 sccm</li> <li>• Working press 0.05-0.3MPa, accuracy ±2%</li> <li>• Independent Pneumatic valve control for each channel flow meter</li> </ul>
Cooling system	<ul style="list-style-type: none"> <li>• 3 lines water cooling, real-time monitoring of temperature and flow.</li> <li>• The system cooling water flow is ≤ 50L/min</li> <li>• The cooling water pressure is</li> </ul>
Temperature sensor	<ul style="list-style-type: none"> <li>• The external infrared thermometer has a temperature range of 300-1400 °C</li> <li>• Temperature control accuracy</li> </ul>

Control system	<ul style="list-style-type: none"><li>• Siemens smart 200 PLC and touch screen control are adopted.</li><li>• The system has a variety of programs, which can realize the automatic balance of growth temperature, accurate control of growth air pressure, automatic temperature rise, automatic temperature drop and other functions.</li><li>• The stable operation of the equipment and comprehensive protection of the equipment can be achieved through the monitoring of water flow, temperature, pressure and other parameters, and the reliability and safety of the operation can be guaranteed through functional interlocking.</li></ul>
Optional function	<ul style="list-style-type: none"><li>• Center monitoring system</li><li>• Substrate basing power</li></ul>

# Bell-Jar Resonator Mpcvd Diamond Machine For Lab And Diamond Growth

Item Number: KTMP315



## Introduction

Get high-quality diamond films with our Bell-jar Resonator MPCVD machine designed for lab and diamond growth. Discover how Microwave Plasma Chemical Vapor Deposition works for growing diamonds using carbon gas and plasma.

[Learn More](#)

Microwave system	<ul style="list-style-type: none"> <li>• Microwave frequency 2450±15MHZ,</li> <li>• Output power 1~10 KW continuously adjustable</li> <li>• Microwave output power stability:</li> <li>• Microwave leakage ≤2MW/cm<sup>2</sup></li> <li>• Output wave guide interface: WR340, 430 with FD-340, 430 standard flange</li> <li>• Cooling water flow: 6-12L/min</li> <li>• System standing wave coefficient: VSWR ≤ 1.5</li> <li>• Microwave manual 3 pin adjuster, excitation cavity, high-power load</li> <li>• Input power supply: 380VAC/50Hz ± 10%, three-phase</li> </ul>
Reaction chamber	<ul style="list-style-type: none"> <li>• Vacuum leakage rate</li> <li>• The limit pressure is less than 0.7 Pa(Standard setup with Pirani vacuum gauge)</li> <li>• The pressure rise of chamber shall not exceed 50Pa after 12 hours of pressure maintaining</li> <li>• Working mode of reaction chamber: TM021 or TM023 mode</li> <li>• Cavity type: Butterfly resonant cavity, with maximum bearing power of 10KW, made of 304 stainless steel, with water-cooled inter-layer, and high purity quartz plate sealing method.</li> <li>• Air intake mode: Top annular uniform air intake</li> <li>• Vacuum sealing: The bottom connection of the main chamber and the injection door are sealed with rubber rings, the vacuum pump and bellows are sealed with KF, the quartz plate is sealed with a metal C-ring, and the rest are sealed with CF</li> <li>• Observation and temperature measurement window: 4 observation ports</li> <li>• Sample load port in front of chamber</li> <li>• Stable discharge within the pressure range of 0.7KPa~30KPa (the power pressure shall be matched)</li> </ul>
Sample holder	<ul style="list-style-type: none"> <li>• Diameter of sample table≥70mm, effective use area≥64 mm</li> <li>• Base plate platform water-cooled sandwich structure</li> <li>• Sample holder can be lifted and lowered evenly electrically in the cavity</li> </ul>
Gas flow system	<ul style="list-style-type: none"> <li>• All metal welding air disk</li> <li>• Welding or VCR joints shall be used for all internal gas circuits of the equipment.</li> <li>• 5 channels MFC flow meter, H<sub>2</sub>/CH<sub>4</sub>/O<sub>2</sub>/N/Ar. H<sub>2</sub>: 1000 sccm ;CH<sub>4</sub>:100 sccm; O<sub>2</sub>: 2 sccm; N<sub>2</sub>: 2 sccm; Ar: 10 sccm</li> <li>• Working press 0.05-0.3MPa, accuracy ±2%</li> <li>• Independent Pneumatic valve control for each channel flow meter</li> </ul>
Cooling system	<ul style="list-style-type: none"> <li>• 3 lines water cooling, real-time monitoring of temperature and flow.</li> <li>• The system cooling water flow is ≤ 50L/min</li> <li>• The cooling water pressure is</li> </ul>
Temperature sensor	<ul style="list-style-type: none"> <li>• The external infrared thermometer has a temperature range of 300-1400 °C</li> <li>• Temperature control accuracy</li> </ul>

Control system	<ul style="list-style-type: none"><li>• Siemens smart 200 PLC and touch screen control are adopted.</li><li>• The system has a variety of programs, which can realize the automatic balance of growth temperature, accurate control of growth air pressure, automatic temperature rise, automatic temperature drop and other functions.</li><li>• The stable operation of the equipment and comprehensive protection of the equipment can be achieved through the monitoring of water flow, temperature, pressure and other parameters, and the reliability and safety of the operation can be guaranteed through functional interlocking.</li></ul>
Optional function	<ul style="list-style-type: none"><li>• Center monitoring system</li><li>• Substrate basing power</li></ul>

# 915Mhz Mpcvd Diamond Machine

Item Number: MP-CVD-101



## Introduction

915MHz MPCVD Diamond Machine and its multi-crystal effective growth, the maximum area can reach 8 inches, the maximum effective growth area of single crystal can reach 5 inches. This equipment is mainly used for the production of large-size polycrystalline diamond films, the growth of long single crystal diamonds, the low-temperature growth of high-quality graphene, and other materials that require energy provided by microwave plasma for growth.

[Learn More](#)

<b>Microwave system</b> (according to optional power supply)	<ul style="list-style-type: none"> <li>• Operating frequency:915±15MHz</li> <li>• Output power:3-75kW continuously adjustable</li> <li>• Cooling water flow:120/min</li> <li>• System standing wave coefficient:VSWR≤1.5</li> <li>• Microwave leakage:</li> </ul>
<b>Vacuum system and reaction chamber</b>	<ul style="list-style-type: none"> <li>• Leakage rate</li> <li>• The ultimate pressure is less than 0.7Pa (this machine comes with imported Pirani vacuum gauge)</li> <li>• The pressure rise in the cavity shall not exceed 50Pa after 12 hours of maintaining pressure.</li> <li>• Reaction chamber working mode: TM021 or TM023 mode</li> <li>• Cavity type: cooled cylindrical cavity, can carry power up to 75KW, high purity ,Stone ring seal.</li> <li>• Inlet method: Top sprinkler head inlet.</li> <li>• Observation temperature measurement window: 8 observation holes, evenly distributed horizontally.</li> <li>• Sampling port: bottom lifting sampling port</li> </ul>
<b>Sample holder system</b>	<ul style="list-style-type: none"> <li>• Sample stage diameter ≥200mm, single crystal effective use area ≥130mm,The effective use area of polycrystalline is ≥200mm. Substrate platform water-cooled sandwich structure, vertical straight up and down.</li> </ul>
<b>Gas system</b>	<ul style="list-style-type: none"> <li>• Full metal welded gas plate 5-7 gas lines</li> <li>• All internal air circuits of the equipment use welding or VCR connectors.</li> </ul>
<b>System cooling</b>	<ul style="list-style-type: none"> <li>• 3-way water cooling, real-time monitoring of temperature and flow.</li> <li>• System cooling water flow 120L/min, cooling water pressure</li> </ul>
<b>Temperature measurement method</b>	<ul style="list-style-type: none"> <li>• External infrared thermometer, temperature range 3001400 M</li> </ul>

serial number	Module name	Remark
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1	Microwave power supply	Standard domestic magnetron: Yingjie Electric / Distinguish power supply Domestic solid-state source: Watson (+30,000) Imported magnetron: MKS/ pastoral (+100, 000)
2	Waveguide, three pins, mode converter, upper resonator	Self made
3	Vacuum reaction chamber (upper chamber, lower chamber, connectors)	Self made
4	Infrared thermometers, optical displacement components, brackets	Infrared thermometers, optical displacement components, Fuji Gold Siemens + Schneider brackets
5	Water-cooling table motion components (cylinders, workpieces, etc.)	
6	Ceramic thin film vacuum gauge, Pirani vacuum gauge	Inficon
7	Vacuum valve components (ultra-high vacuum gate valve, precision pneumatic valve*2, electromagnetic vacuum charging differential valve)	Fujikin + Zhongke + Himat
8	Vacuum pump and connecting pipe fittings, tee, KF25 bellows*2, adapter	Pump: Flyover 16L
9	Metal microwave sealing ring*2; metal vacuum sealing ring*1; Quartz plate	Quartz: Shanghai Feilihua Semiconductor Grade High Purity Quartz
10	Circulating water components (joints, diverter blocks, flow detectors)	Japanese SMC/CKD
11	Pneumatic part (CKD filter, airtac multi-way solenoid valve, pipe fittings and adapters)	
12	Gas connector, EP gas pipe, VCR connector, filter 0.0023μm *1, filter 10μm*2	Fujikin
13	Machine casing, stainless steel table, universal wheels, feet, bracket fastening screws, etc	custom processing
14	Gas flow meter*6 (including one pressure control)	Standard seven-star , optional Fuji Gold ( +34,000 ) / Alicat (42,000)
15	Gas plate processing (5-way gas, filter*5, pneumatic valve*5, manual valve*6, pipeline welding)	Fuji Gold
16	PLC automatic control	Siemens + Schneider
17	Molybdenum table	





## Kintek Solution

Head Quarter: No.89 Science Avenue, High-Tech Zone,  
Zhengzhou, China

Hongkong Office: 300 Lockhart Road, Wan Chai,  
Hongkong

Canada Office: Boulevard Graham, Mont-Royal, QC, H3P  
2C7, Canada

