Slidable Dual Zone PECVD Tube Furnace (80 mm OD) with 4 Channel Gas Delivery & Oil-less Vacuum System

OTF-1200X-80-II-4CV-PE-SL

OTF-1200X-80-II-4CV-PE-SL is a dual zone slidable PE-CVD tube furnace system consists of 500W RF plasma source, 80Dx1600L mm split tube furnace with an integrated slidable rail, a 4-channel precision mass flow meter with gas mixing tank, and a high quality oil-less vacuum pump. Such a PE-CVD furnace is a new tool to grow Nano-wire or graphene with the following benefits:

- Lower temperature processing compared to conventional CVD
- High heating & cooling rate using sliding furnace
- Dual heating zone to create thermal gradient up to 200ºC
- 1100ºC Max. working temperature
- Offers a wide range of material deposition, such as Carbon & ZnO nanowire (or tube) and single layer graphene

SPECIFIATIONS

Dual Zone Split Tube furnace with Sliding Rail	• Max 1100ºC for continuous heating • Two programmable precision digital temperature controllers with 30 segments. • Two separately controlled Heating Zones:

	High purity quartz tube: ○ 200mm length for each heating zone ○ 400mm total in heating length ○ 250mm constant central temperature heating area if both zones were heated at the same temperature ○ 500ºC max temperature discrepancy between two zone with thermoblocks • 3.14" (80mm) OD x 2.83" ID x 71" Length - Standard or 2" (50mm) OD x 1.7" ID x 71" Length - Optional or 4" (101mm) OD x 2.83" ID x 71" Length - Optional • One pair of vacuum-sealed flange with water cooling jacket and stainless steel needle valves • Input power: 208 – 240V AC, single phase at max. 4KW
Plasma RF Power Supply	• Output Power: 5 -500W adjustable with ± 1% stability • RF frequency: 13.56 MHz ±0.005% stability. • Reflection Power: 200W max. • Matching: Automatic • RF Output Port: 50 Ω, N-type, female • Noise: <50 dB. • Cooling: Air cooling. • Power : 208-240VAC, Single Phase, 50/60Hz
Oil-less Vacuum Pump Station and Valves	• Pfeiffer's High Speed (226L/min) Oil-less Dry Vacuum Pump, 10E-3 Torr Limit is installed inside the heavy duty mobile cart • KF25 adapter and stainless steel pipe are connected between pump and tube flange with precision ball valve for customer's plug and play • 10E-2 Torr vacuum can be achieved inside processing tube • Digital vacuum gauge (made in USA) is installed on the left flange
Mass Flow meters & Gas Mixing Station	• Four precision mass flow meters (0.02% accuracy) with digital displays are installed on the bottom case to control gas flow rate automatically. One gas mixing tank is installed on bottom case with liquid release valve. ○ MFC 1: Gas flow range from 0~100 sccm ○ MFC 2&3: Control range from 0~200 sccm ○ MFC 4: Control range from 0~500 sccm • 4 stainless steel needle valves are installed on the left side of bottom case to manually control the mixing of 4 gas types. • Gas inlet fitting: four 1/4NPS. • Gas outlet fitting: four 1/4NPS.

	• Power: 185-220VAC 50/60Hz
Heating & Cooling Rates	• RS485 port and software are installed and allow remote control temperature profile by PC (not included, customer can order one from here) • In order to achieve Max.heating rate, the user must preheat furnace to desired temperature , then slide the furnace to the sample zone of the tube • In order to achieve the Max. cooling rate, push the heated furnace from hot zone to cold zone Heating Rate: 15°C/sec (RT - 150°C); 10°C/sec (150°C - 250°C); 7°C/sec (250°C - 350°C); 4°C/sec (350°C - 500°C); 3°C/sec (350°C - 550°C); 2°C/sec (550°C - 650°C); 1°C/sec (650°C - 800°C); 0.5°C/sec (800°C - 1000°C); Cooling Rate: 15°C/sec (1000 - 950°C); 10°C/sec (950°C - 900°C); 7°C/sec (900°C - 850°C); 4°C/sec (850°C - 750°C); 2°C/sec (750°C - 600°C); 1.5°C/sec (600°C - 500°C); 1°C/sec (500°C - 400°C); 0.5°C/sec (400°C - 300°C);
Water Cooling for Flanges	• Water cooling flanges require >= 10L/M water flow. • Users may use tap water as coolant, but the use of a recirculating water chiller to save every single drop of water is strongly suggested. • Please go to http://mtixtl.com/ThermolysisWater-cooledChiller-EQ-CW3000AG.aspx to order the water chiller at extra cost
Optional	Four channel gas flows can be integrated into one PLC with touch screen panel to control at extra cost
Overall Dimensions	• Furnace: 550 x 380 x 520 mm • Sliding Rail: dual rail with 1750 mm length • Two Adjoined Bottom Mobile Cases: 1200 x 1200 x 1200mm. • Net weight: 220 Lbs. • Shipping weight: 500lbs.
Warranty	One year limited warranty with lifetime support (Consumable parts such as processing tubes, O-rings and heating elements are not covered by the warranty).
Compliance	CE CE Certified
	• Tube furnaces with quartz tubes are designed for using

Application Notes	under vacuum and low pressure < 0.12 MPa (absolute pressure). • Click here to learn How to set up quartz/ ceramic tube and vacuum flange for MTI Tube furnace. • MTI reserves the right to modify its PE-CVD design at any time without notice, but promises quality in future designs meet and exceed the specifications above.

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