TORONTECH

CVD TUBE FURNACE – TT-CVDTF-80-1200

CVD Tube Furnace – TT-CVDTF-80-1200 is a 1200°C system designed for Chemical Vapor Deposition (CVD), a process where chemical gases or vapors react on the surface of a substrate to form coatings or nanomaterials. It is widely used in the semiconductor industry to deposit various materials, including insulating layers, metals, and metal alloys.

APPLICATIONS

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- **Semiconductor Fabrication** – Used for thin-film deposition of insulating layers, metals, and alloys on wafers and substrates. Ensures precision, repeatability, and uniformity required in advanced semiconductor manufacturing.
- **Nanomaterials Synthesis** – Enables the growth of carbon nanotubes (CNTs), graphene, and other nanostructures via CVD. Supports research and development of high-performance nanomaterials with controlled morphology.
- **Protective & Functional Coatings** – Suitable for applying wear-resistant, corrosion-resistant, and catalytic coatings on metals, ceramics, and composites. Extensively applied in aerospace, automotive, and energy industries.

- **Advanced Ceramics & Composites** – Facilitates the deposition of ceramic layers and composites with tailored microstructures for enhanced thermal and mechanical performance.
- **Catalyst Preparation & Petrochemical Research** – Supports catalyst fabrication, modification, and testing under vacuum or controlled gas atmospheres. Used in petrochemical and chemical engineering labs for industrial simulations.
- **Energy & Battery Technology** – Applied in coating electrodes, electrolytes, and protective layers for lithium-ion and solid-state batteries. Enhances material stability and performance.
- **Universities & Research Institutes** – A versatile platform for academic and industrial R&D in physics, chemistry, and materials science. Widely adopted in teaching labs and advanced research projects.
- **Industrial Testing & Quality Control** – Provides reliable high-temperature CVD processing for validation, certification, and pilot-scale production in regulated industries (ISO, CE, SGS, TÜV certified).

FEATURES

Furnace Shell
The furnace shell is constructed from Q235 low-carbon steel, featuring an electrostatically resistant and corrosion-resistant finish. A solid, double-layer metal frame is integrated with a heat-insulating fan structure, helping to maintain a low external surface temperature. Designed for horizontal operation, it features a top-opening lid for easy access and handling.

Refractory Material
The multi-layer insulation system is made of lightweight alumina ceramic fiber combined with high-quality insulation board backing. This design is asbestos-free, offers low heat loss, and supports energy efficiency.

Heating System
The heating system uses high-grade HRE spiral resistance wire elements, securely embedded on the furnace walls. Heating is achieved through free heat radiation inside the chamber, ensuring high efficiency and extended service life. Circular heating by resistance wire promotes excellent temperature uniformity throughout the chamber.

Temperature Control Panel
Equipped with PID and SSR control modes, the system delivers precise temperature regulation. It uses a standardized N-type nickel-chromium-silicon thermocouple, capable of measuring temperatures from 0–1300°C with long-term reliability. A safety interlock switch disconnects power when the furnace door is opened.

Program Controller
Features an advanced controller suitable for demanding thermal processing. It offers user-friendly operation and flexible programming. Up to 30 programmable segments can be set for a single thermal curve. The system includes over-temperature and fault alarms with automatic protection.

Vacuum and Atmosphere Control
Comes with a 304 stainless steel sealing flange to create a vacuum or controlled atmosphere inside the tube. The standard setup includes a high-quality quartz glass working tube, with optional metal or corundum tubes available for varied process needs. A high-performance dual-stage rotary vane vacuum pump achieves vacuum levels down to 5 Pa, with a digital vacuum gauge for monitoring. An integrated gas flow control unit supports 1 to 3-channel MFC-based automatic gas flow systems.

TECHNICAL SPECIFICATIONS

Item	TT-CVDTF-25-1200	TT-CVDTF-40-1200	TT-CVDTF-60-1200	TT-CVDTF-80-1200	TT-CVDTF-100-1200	TT-CVDTF-120-1200
Tube Size	Φ25 x 800mm	Φ40 x 1000mm	Φ60 x 1000mm	Φ80 x 1000mm	Φ100 x 1000mm	Φ120 x 1000mm
Max Temperature	1200℃					

Work Temperature	1100℃					
Heating Zone	440mm					
Voltage/Power	220V/1.8KW (110V is also available)	220V/1.8KW (110V is also available)	220V/2.6KW (110V is also available)	220V/2.6KW (110V is also available)	220V/2.6KW (110V is also available)	220V/5KW (110V is also available)
Heating Element	HRE alloy resistance wire					
Chamber Material	Polycrystalline inorganic alumina ceramic fiber material prepared by wet vacuum filtration					
Tube Material	Quartz Tube					
Temperature Accuracy	±1℃					
Thermocouple	N type thermocuple					
Temperature Controller	Intelligent microcomputer PID temperature control instrument, SCR/SSR control, PID parameter self-tuning function; programmable 4 groups of 8 program segments, program heating, program heat preservation, program cooling					
Heating Rate	1-25℃/min freely set					
Furnace Structure	Furnace temperature control integrated structure, furnace opening and closing; double-layer shell, air circulation and heat insulation					
Sealing Function	Both ends of the furnace tube are equipped with stainless steel metal flanges, matched with high-temperature PTFE gaskets, which can work under vacuum with a vacuum degree of ≤5pa (rotary vane vacuum pump)					
Atmosphere Performance	There are air inlets and outlets at both ends of the flange. The pressure gauge is installed on the metal flange. The precision needle valve can adjust the air intake and output, and can be fed with protective gases such as nitrogen, argon, and hydrogen.					
Equipment Safety	Modular control, sound and light alarm signal will be sent out for over temperature and broken coupler in the working process, and the protection action will be completed automatically					
Safety Protection	The equipment is equipped with a circuit breaker, which will automatically pop open in case of short circuit leakage, which can protect the safety of equipment and operators					
Furnace Shell	High-quality cold-rolled steel plate CNC machine tool blanking processing, after welding, grinding, polishing, phosphating, pickling, surface electrostatic spraying plastic powder					

Quality Certificate	ISO9001 CE SGS TUV
Standard Accessroies	1. Furnace Body 2. Temperature Controller 3. Power Cable 3 meters 4.Thermocouple 5.Manual 6. Furnace Hook 7. One pair of high temperature gloves 8. Two pipe plugs 9. One set of sealing flange
Optional Accessories	1. Optional rotary vane vacuum pump (vacuum degree ≤ 5pa 2. Optional digital vacuum gauge (1.0×105-1.0×10-1pa) 3. Optional float flowmeter (range 60-600ml/min) 4. Optional with quartz boat

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