



TORONTECH



CVD TUBE FURNACE - TT-CVDTF-100-1400

TT-CVDTF-100-1400 is a 1400°C tube furnace designed for Chemical Vapor Deposition (CVD), a process where chemical gases or vapors react on the surface of a substrate to produce coatings or nanomaterials. This technique is widely used in the semiconductor industry for depositing various materials, including numerous types of insulating layers, metals, and metal alloys.

APPLICATIONS

Semiconductor Manufacturing – Enables high-temperature CVD deposition of insulating layers, metals, and metal alloys on semiconductor wafers. Delivers exceptional uniformity and precise thermal control, critical for advanced microelectronics and optoelectronic devices.

Nanomaterials Development – Supports controlled synthesis of graphene, carbon nanotubes, and advanced nanostructures at elevated temperatures. Provides reproducibility and stability for next-generation nanotechnology research and applications.

Advanced Ceramics & Refractories – Facilitates sintering and coating of ceramic substrates under vacuum or controlled atmospheres. Enhances thermal resistance, chemical durability, and mechanical performance for high-demand industrial and aerospace applications.

Thin Film Research – Enables deposition of high-purity thin films with tailored composition and morphology. Suitable for dielectric coatings, protective films, and multilayer structures for electronics, optics, and surface engineering.

Catalysis & Chemical Engineering – Provides precise thermal and atmospheric conditions for catalyst activation, coating, and material modification. Widely used in R&D for chemical, petrochemical, and environmental applications.

Energy & Battery Materials – Supports deposition and thermal treatment of electrode coatings, solid electrolytes, and protective layers for lithium-ion and next-generation batteries. Ensures stability, conductivity, and performance in high-energy systems.

Aerospace & Defense Materials – Enables processing of high-performance alloys, ceramics, and coatings used in aerospace and defense applications. Ensures oxidation resistance, mechanical strength, and thermal stability under extreme environments.

Universities & Research Institutes – Ideal for advanced academic research in physics, chemistry, materials science, and nanotechnology. Offers flexible programming, precise temperature control, and robust safety features for laboratory innovation.

Industrial Quality Control & Certification – Delivers reliable high-temperature CVD processes for validation, compliance verification, and product certification. Meets ISO9001, CE, SGS, and TÜV standards for regulated industries worldwide.

FEATURES

Furnace Shell

- The shell is constructed from Q235 low-carbon steel with a corrosion-resistant, electrostatically treated surface.
- A solid, double-layer metal frame is integrated with a heat-insulating fan structure to keep the exterior surface temperature low.
- The furnace is designed for horizontal use with a top-opening structure for convenient operation.

Refractory Material

- The insulation features a multi-layer design composed of lightweight alumina ceramic fiber and a high-grade insulation board backing.
- It is free of asbestos and engineered for minimal heat loss and energy consumption.

Heating System

- Premium SiC spiral resistance wire heating elements are securely embedded in the furnace walls and radiate heat freely within the chamber.
- This design delivers energy efficiency, high thermal performance, and extended service life.
- The resistance wire provides ring heating to ensure excellent temperature uniformity inside the chamber.

Temperature Control Panel

- Utilizes PID and SSR control for accurate temperature management.
- Equipped with an internationally standardized S-type nickel-chromium-silicon thermocouple, capable of measuring temperatures from 0°C to 1400°C with reliable longevity.
- The furnace door includes a built-in safety switch that cuts power when the door is opened.

Program Controller

- Advanced controller supports a wide range of processing requirements.
- User-friendly interface with flexible programming options.
- Capable of storing up to 30 programmable segments in a single temperature curve.
- Features over-temperature and fault alarms with automatic safety protection.

Vacuum & Atmosphere Capability

- Includes a 304 stainless steel sealing flange to allow operation under vacuum or controlled atmosphere conditions.
- Comes standard with a high-purity quartz working tube; optional metal or corundum tubes are available to meet various application needs.
- The system includes a high-performance dual-stage rotary vane vacuum pump capable of reaching 5 Pa, with a digital gauge for real-time vacuum level display.
- An integrated air circuit control unit supports 1 to 3-channel MFC-based automatic gas flow control.

TECHNICAL SPECIFICATIONS

Item	TT-CVDTF-25-1400	TT-CVDTF-40-1400	TT-CVDTF-60-1400	TT-CVDTF-80-1400	TT-CVDTF-100-1400	TT-CVDTF-120-1400
Tube Size	Φ25 x 800mm	Φ40 x 1000mm	Φ60 x 1000mm	Φ80 x 1000mm	Φ100 x 1000mm	Φ120 x 1000mm
Max Temperature	1400℃					
Work Temperature	1300℃					
Heating Zone	440mm					
Voltage/Power	220V/2KW (110V is also available)	220V/2KW (110V is also available)	220V/3KW (110V is also available)	220V/4KW (110V is also available)	220V/5KW (110V is also available)	220V/5KW (110V is also available)
Heating Element	Silicon Carbide Rod □ SIC □ Heater					
Chamber Material	Polycrystalline inorganic alumina ceramic fiber material prepared by wet vacuum filtration					
Tube Material	Alumina Tube					
Temperature Accuracy	±1℃					
Thermocouple	S type thermocouple					
Temperature Controller	Intelligent microcomputer PID temperature control instrument, SCR/SSR control, PID parameter self-tuning function; programmable 30 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 $\leq 5\text{pa}$ 2. Optional digital vacuum gauge (1.0×10^5 - $1.0 \times 10^{-1}\text{pa}$) 3. Optional float flowmeter (range 60-600ml/min) 4. Optional with quartz boat



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