



TORONTECH

VERTICAL 3-ZONE TUBE FURNACE 1200°C - TT- VTF3Z-60-1200



Vertical 3-Zone Tube Furnace 1200°C - TT-VTF3Z-60-1200 is designed for high-temperature heat treatment and sintering of metal, ceramic, nano, semiconductor, and powder metallurgy materials. It is widely used in universities, research institutes, manufacturing facilities, petrochemical operations, and the aerospace sector.

APPLICATIONS

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- **Advanced Ceramic Materials** – Supports high-temperature sintering, densification, and crystallization of technical ceramics. Ensures exceptional thermal resistance, mechanical strength, and microstructural uniformity for industrial and research applications.
- **Nanomaterials Research** – Provides precise multi-zone thermal processing for nanostructures, catalysts, and functional composites. Independent zone control prevents thermal gradients, enabling uniform particle properties essential for high-performance applications.
- **Semiconductor & Electronics Processing** – Facilitates diffusion, oxidation, and annealing of semiconductor wafers and electronic materials under vacuum or controlled atmosphere. Ensures accuracy and reproducibility critical to microelectronics and optoelectronics development.

- **Powder Metallurgy & Metal Processing** – Enables sintering, reduction, and heat treatment of metallic powders and alloys. Vertical design combined with 3-zone heating ensures uniform densification and excellent material performance.
- **Petrochemical & Catalyst Research** – Ideal for catalyst calcination, regeneration, and reaction mechanism studies. Multi-zone control and controlled atmosphere options deliver reproducible thermal environments for chemical R&D.
- **Aerospace & Defense Materials** – Provides precise thermal processing of superalloys, ceramics, and advanced composites used in aerospace applications. Ensures structural stability and high-temperature performance for mission-critical components.
- **Energy & Battery Innovation** – Supports the calcination and sintering of electrode powders, solid electrolytes, and next-generation energy materials. Delivers consistent high-temperature treatment essential for reliable energy storage performance.
- **Universities & Research Institutes** – Designed for advanced studies in materials science, chemistry, and engineering. Offers versatile programming, multi-zone flexibility, and robust safety features for academic laboratories.
- **Industrial Quality Control & Pilot Production** – Enables precise thermal testing and small-scale production under vacuum or atmosphere-controlled conditions. Conforms to ISO, CE, SGS, and TÜV standards for certification and regulated industry compliance.

FEATURES

Furnace Shell

- The shell is constructed from Q235 low-carbon steel and features a corrosion-resistant, electrostatically treated surface. Its robust, double-layer metal frame is integrated with a heat-insulating fan structure, keeping the exterior temperature low. Designed for vertical operation, it includes a side-opening cover for ease of use.

Refractory Material

- The furnace features a multi-layer insulation system made from lightweight alumina ceramic fiber backed with high-quality insulation boards. It contains no asbestos, minimizes heat loss, and reduces energy consumption.

Heating System

- The heating element consists of high-grade HRE spiral resistance wire, securely embedded on the furnace surface. Heat is distributed efficiently through free radiation within the chamber, ensuring energy savings and extended service life.
- Ring-style resistance wire heating provides excellent temperature uniformity.
- The system is divided into three independent temperature zones, allowing each zone to be heated separately.

Temperature Control Panel

- Equipped with PID control and SSR/SCR output for accurate temperature regulation.
- Utilizes an internationally standardized N-type nickel-chromium-silicon thermocouple, with a temperature range of 0–1300°C and long operational life.
- Includes a safety interlock switch that cuts power when the furnace door is opened.

Program Controller

- Features advanced control systems designed to meet complex processing needs.
- User-friendly interface with flexible programming capabilities.
- Supports up to 30 programmable segments per curve.
- Includes over-temperature and fault alarms with automatic safety shutdown.

Vacuum and Atmosphere Function

- Fitted with a 304 stainless steel sealing flange, enabling operation under vacuum or controlled atmosphere.

- Compatible with high-quality alumina tubes, metal tubes, or quartz glass tubes to suit various application environments.

TECHNICAL SPECIFICATIONS

Item No	TT-VTF3Z-40-1200	TT-VTF3Z-60-1200	TT-VTF3Z-80-1200	TT-VTF3Z-100-1200
Tube Size	Φ40 x 1500mm	Φ60 x 1500mm	Φ80 x 1500mm	Φ100 x 1500mm
Rated Temperature	1200°C			
Work Temperature	1100°C			
Heating Zone	300+300+300mm			
Voltage/Power	220V/5.4KW (110V is also available)	220V/7.8KW (110V is also available)	380V/7.8KW	380V/7.8KW
Heating Element	HRE high temperature alloy resistance wire			
Chamber Material	Polycrystalline inorganic alumina ceramic fiber material prepared by wet vacuum filtration			
Tube Material	Quartz Tube			
Temperature accuracy	±1°C			
Thermocouple	N type thermocouple			
Temperature Controller	Intelligent microcomputer PID temperature control instrument, SSR control, PID parameter self-tuning function; programmable 4 groups of 8 program segments, program temperature rise, program heat preservation, program cooling			
Heating Rate	1-25°C/min freely adjust			
Furnace Structure	Furnace temperature control integrated structure; 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 $\leq 5\text{pa}$ (rotary vane vacuum pump)
Atmosphere Function	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.
Furnace Protection	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
Shell	High-quality cold-rolled steel plate CNC machine tool blanking processing, after welding, grinding, polishing, phosphating, pickling, surface electrostatic spraying plastic powder
Certificate	ISO9001 CE SGS TUV
Standard Accessories	1. Furnace body 2. Temperature controller 3. Power cord 3 meters 4. Thermocouple 5. Instruction manual 6. Furnace hook 7. High temperature gloves 8. Pipe plug 9. Sealing flange
Optional Accessories	1. Optional rotary vane vacuum pump (vacuum degree $\leq 5\text{pa}$) 2. Optional digital vacuum gauge ($(1.0 \times 10^5 - 1.0 \times 10^{-1}\text{pa})$) 3. Optional float flowmeter (range 60-600ml/min) 4 , optional corundum boat



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