TORONTECH

SINGLE ZONE HIGH TEMPERATURE TUBE FURNACE 1700°C - TT-TF1Z-80-1700

Single Zone High Temperature Tube Furnace 1700°C - TT-TF1Z-80-1700 is designed for sintering and heat treatment of metals, ceramics, nanomaterials, semiconductors, powder metallurgy, and other advanced materials. It is widely used in universities, research centers, manufacturing facilities, and industries such as petrochemical and aerospace.

APPLICATIONS

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- **Advanced Ceramic Materials** – Enables ultra-high temperature sintering and densification of technical ceramics. Ensures exceptional structural integrity, thermal resistance, and mechanical performance for advanced industrial and research applications.

- **Nanomaterials & Functional Composites** – Provides stable and uniform heat treatment for nanostructures, thin films, and advanced composites. Supports R&D in high-performance materials for catalysis, energy storage, and electronic devices.

- **Semiconductor & Electronics Research** – Facilitates annealing, diffusion, and oxidation of semiconductor substrates at ultra-high temperatures. Delivers precise control critical for microelectronics, optoelectronics, and next-generation chip development.

- **Powder Metallurgy** – Supports high-temperature consolidation of metal and alloy powders into dense, uniform components. Widely applied in the production of complex alloys and metallurgical studies requiring superior accuracy.

- **Petrochemical & Chemical Laboratories** – Suitable for catalyst activation, thermal decomposition, and reaction mechanism studies under vacuum or controlled atmospheres. Ensures reproducibility and precision in high-temperature chemical research.

- **Aerospace Materials Engineering** – Enables the testing and processing of high-performance alloys, ceramics, and composites used in aerospace applications. Provides thermal stability validation under extreme operating environments.

- **Energy & Battery Research** – Provides controlled high-temperature treatment of lithium-ion and solid-state battery materials, fuel cell components, and solid electrolytes. Enhances stability, safety, and performance of next-generation energy systems.

- **Universities & Research Institutes** – Ideal for advanced studies in physics, chemistry, and materials science. Combines programmable thermal processing, flexible atmosphere control, and robust safety features for reliable academic research.

- **Industrial Quality Control & Certification** – Delivers reproducible ultra-high temperature testing for compliance verification, product certification, and process validation. Meets ISO, CE, SGS, and TÜV standards required in regulated industries.

FEATURES

Furnace Shell

- The shell is constructed from Q235 low-carbon steel with an electrostatic coating for enhanced corrosion resistance.
- A durable double-layer metal frame is combined with an insulated fan structure, keeping the exterior surface temperature low.
- The horizontal configuration ensures simple and convenient operation.

Refractory Material

- The furnace features a multi-layer insulation system made from lightweight alumina ceramic fiber and premium-grade insulation boards.
- Free of asbestos, this design ensures minimal heat loss and low energy consumption.

Heating System

- Premium $MoSi_2$ heating elements are securely mounted on both sides of the chamber, providing efficient and consistent radiant heating.
- Dual-sided heating (left and right) ensures excellent temperature uniformity throughout the furnace.
- This design supports high energy efficiency and extended service life.

Temperature Control Panel

- Equipped with PID and SSR control for precise temperature management.
- Uses a standard B-type Ni-Cr-silicon thermocouple with a temperature range of 0–1800°C and a long operational lifespan.
- Features include a heating status indicator and an over-temperature alarm with buzzer.

Program Controller

- Advanced control system supports complex processing needs.
- User-friendly interface with flexible programming options.
- Capable of storing up to 30 programmable segments.
- Includes over-temperature protection and fault alarms for safe and reliable operation.

Vacuum and Atmosphere Capability

- Comes with a 304 stainless steel sealing flange for creating vacuum or atmosphere conditions within the furnace tube.
- Includes a high-purity quartz glass tube, with optional metal or corundum tubes available for specific applications.

TECHNICAL SPECIFICATIONS

Model	TT-TF1Z-40-1700	TT-TF1Z-60-1700	TT-TF1Z-80-1700	TT-TF1Z-100-1700
Tube size	Φ40 x 900mm	Φ60 x 900mm	Φ80 x 900mm	Φ100 x 900mm
Max Temperature	1700℃			
Working temperature	1600℃			
Heating zone size	300mm			
Voltage	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	MoSi2			
Furnace material	Polycrystalline inorganic alumina ceramic fiber material prepared by wet vacuum filtration			
Furnace tube material	High purity corundum tube			
Temperature control accuracy	±1℃			

Temperature measuring element	B-type national standard platinum rhodium thermocouple
Temperature control instrument	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	1-15℃/min free adjustment
Furnace structure	Furnace temperature control integrated structure; double-layer shell, air circulation and heat insulation
Sealing performance	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 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
Quality Certification	ISO9001 CE SGS TUV
The standard configuration	1. 1 furnace body 2. 1 temperature controller 3. Power cord 3 meters 4. 1 thermocouple 5. 1 manual 6. One 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 corundum boat

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