TORONTECH

3-ZONE TUBE FURNACE 1700°C – TT-TF3Z-100-1700

3-Zone Horizontal Tube Furnace 1700°C – TT-TF3Z-100-1700 is designed for sintering and high-temperature heat treatment of metal, ceramic, nanomaterial, semiconductor, powder metallurgy, and other advanced materials. It is widely used in universities, research institutions, manufacturing facilities, as well as industries such as petrochemical and aerospace.

APPLICATIONS

3-Zone Tube Furnace 1700°C – TT-TF3Z-100-1700

- **Advanced Ceramic Materials** – Supports ultra-high temperature sintering and densification of ceramics, ensuring superior structural integrity, thermal resistance, and mechanical strength for industrial and research applications.
- **Nanomaterials Research** – Provides precise, uniform thermal processing for nanostructures and advanced composites. Ideal for R&D in functional nanomaterials used in electronics, catalysis, and energy storage.
- **Semiconductor Materials** – Facilitates annealing, diffusion, and oxidation of semiconductor substrates at extreme temperatures. Ensures precise thermal control critical for microelectronics and optoelectronics development.
- **Powder Metallurgy** – Enables high-temperature sintering of metal powders into dense, uniform components. Widely applied in manufacturing complex shapes, advanced alloys, and research-grade materials.
- **Petrochemical & Chemical Laboratories** – Suitable for catalyst activation, thermal decomposition, and reaction mechanism studies requiring temperatures up to 1700°C. Delivers reproducible, accurate results for chemical R&D.

- **Aerospace Materials Engineering** – Ideal for testing and processing high-performance alloys, ceramics, and composites for aerospace applications. Ensures thermal stability and material strength under extreme conditions.

- **Energy & Battery Research** – Provides thermal treatment for solid-state electrolytes, lithium-ion battery materials, and next-generation energy storage systems. Maintains high-temperature stability and uniformity for advanced energy materials.

- **Universities & Research Institutes** – Perfect for advanced studies in physics, chemistry, materials science, and engineering. Offers flexible programming, reliable operation, and robust safety features for academic laboratories.

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

FEATURES

Furnace Shell

- The shell is constructed from Q235 low-carbon steel and features an electrostatically coated surface that resists corrosion. A durable double-layer metal frame is integrated with a heat-insulating fan system, helping to maintain a low exterior surface temperature. The furnace is designed for horizontal operation with an easy-access top-opening structure.

Refractory Material

- The insulation system features a multi-layer design composed of lightweight alumina ceramic fiber and a high-quality insulation board. It is asbestos-free, provides minimal heat loss, and supports low energy consumption.

Heating System

- Equipped with high-grade HRE heating elements, the system delivers radiant heat throughout the furnace chamber, ensuring energy efficiency and an extended service life. Heating can be configured in a circular or dual-sided layout to promote uniform temperature distribution. The dual-zone heating system allows each zone to be independently controlled, enhancing thermal consistency.

Temperature Control Panel

- Utilizes PID and SSR control modes for precise temperature regulation. A B-type Ni-Cr-Si thermocouple (0–1800°C range) is included for accurate temperature readings and long-term reliability. The panel also features a heating indicator and an over-temperature alarm buzzer for added safety.

Program Controller

- An advanced controller supports up to 30 programmable segments to accommodate complex processing needs. It offers intuitive operation and flexible programming, along with automatic safety features such as over-temperature and fault alarms.

Vacuum and Atmosphere Capability

- Includes a 304 stainless steel sealing flange to enable vacuum or atmosphere control within the furnace tube. The system comes with a high-quality quartz glass working tube, and users may opt for a metal or corundum tube depending on the application.

TECHNICAL SPECIFICATIONS

Model Item	Heating Zone□ mm □	Tube Size (mm)	Max Temperature	Work Temperature	Voltage	Power	Heating Element	Temperature Accuracy
TT-TF3Z-40-1700	200+200+200	Φ40×1200	1700℃	1600℃	380V	6KW	MoSi2	±1℃

TT-TF3Z-60-1700	200+200+200	Φ60×1200	1700℃	1600℃	380V	9KW	MoSi2	±1℃
TT-TF3Z-80-1700	200+200+200	Φ80×1200	1700℃	1600℃	380V	12KW	MoSi2	±1℃
TT-TF3Z-100-1700	200+200+200	Φ100×1200	1700℃	1600℃	380V	12KW	MoSi2	±1℃

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