TORONTECH

3-ZONE HORIZONTAL TUBE FURNACE 1200°C – TT-TF3Z-150-1200

The 3-Zone Horizontal Tube Furnace 1200°C – TT-TF3Z-150-1200 is engineered for sintering and high-temperature heat treatment of metals, ceramics, nanomaterials, semiconductors, powder metallurgy, and other advanced materials. Widely used in universities, research institutions, manufacturing facilities, and industries such as petrochemical and aerospace, this furnace provides precise and uniform heating for advanced material processing. It features a high-purity quartz tube with an outer diameter of Φ150 mm and three independently controlled heating zones, each 300 mm in length, allowing continuous operation at 1100 °C and a maximum temperature of 1200 °C.

Powered by 380 V/7.8 kW, the furnace incorporates 1500-type polycrystalline alumina ceramic fiber heating elements with an N-type thermocouple for accurate temperature control and consistent thermal uniformity. Its robust design includes a corrosion-resistant Q235 low-carbon steel shell, multi-layer insulation to minimize heat loss, and a durable frame, making it ideal for laboratories and industrial applications that demand reliable high-temperature performance.

APPLICATIONS

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- **Advanced Ceramic Materials** – Enables high-temperature sintering and densification of ceramics, ensuring excellent structural integrity, thermal resistance, and mechanical strength for industrial and research applications.

- **Nanomaterials Research** – Provides precise, uniform thermal processing for nanostructures and advanced composites. Supports R&D in functional nanomaterials used in electronics, catalysis, and energy storage.

- **Semiconductor Materials** – Facilitates annealing, diffusion, and oxidation of semiconductor substrates at ultra-high temperatures. Ensures precise temperature control critical for microelectronics and optoelectronics development.

- **Powder Metallurgy** – Supports high-temperature sintering of metal powders into dense, uniform components. Widely used for manufacturing complex shapes and advanced alloys in research and production environments.

- **Petrochemical & Chemical Laboratories** – Suitable for catalyst activation, thermal decomposition, and reaction mechanism studies requiring temperatures up to 1200°C. Delivers accurate, reproducible results for chemical R&D.

- **Aerospace Materials Engineering** – Enables testing and processing of high-performance alloys, ceramics, and composites used in aerospace applications. Ensures thermal stability and strength validation under extreme conditions.

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

- **Universities & Research Institutes** – Ideal for advanced studies in physics, chemistry, materials science, and engineering. Offers versatile programming, reliable performance, and robust safety 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

- Constructed from Q235 low-carbon steel, the shell features an electrostatically resistant and corrosion-resistant finish. A robust double-layer metal frame is integrated with a heat-insulating fan structure to maintain a low external temperature. The horizontal layout and top-opening design ensure ease of use.

Refractory Material

- The furnace uses a multi-layer insulation system composed of lightweight alumina ceramic fiber and high-performance insulation boards. It is free of asbestos, with minimal heat loss and reduced energy consumption.

Heating System

- Equipped with premium metal and ceramic heating elements, the furnace delivers radiant heat evenly within the chamber for efficient, energy-saving performance and extended operational life.
- The ring or dual-sided heating configuration promotes excellent temperature uniformity.
- Each of the three heating zones can be individually controlled for enhanced precision.

Temperature Control Panel

- Utilizes PID technology with SSR/SCR control for accurate temperature management.
- Includes a high-quality thermocouple that ensures durability and consistent performance.
- Features a heating indicator light and an over-temperature alarm buzzer for added safety.

Program Controller

- Advanced controller supports complex processing needs with a user-friendly interface and flexible programming.
- Allows up to 30 programmable segments.
- Includes over-temperature and fault alarms with built-in safety protections.

Vacuum and Atmosphere Capabilities

- Features a 304 stainless steel sealing flange to enable vacuum or controlled atmosphere inside the furnace tube.
- Compatible with quartz glass, metal, or alumina tubes to accommodate various application requirements.

TECHNICAL SPECIFICATIONS

Model Item	Heating Zone（mm）	Tube Size (mm)	Max Temperature	Work Temperature	Voltage	Power	Heating Element	Temperature Accuracy
TT-TF3Z-40-1200	300+300+300	Φ40×1500	1200℃	1100℃	220V (110V is also available)	5.4KW	HRE	±1℃
TT-TF3Z-60-1200	300+300+300	Φ60×1500	1200℃	1100℃	380V	7.8KW	HRE	±1℃
TT-TF3Z-80-1200	300+300+300	Φ80×1500	1200℃	1100℃	380V	7.8KW	HRE	±1℃
TT-TF3Z-100-1200	300+300+300	Φ100×1500	1200℃	1100℃	380V	7.8KW	HRE	±1℃
TT-TF3Z-40-1400	200+200+200	Φ40×1200	1400℃	1350℃	220V (110V is also available)	5KW	SIC	±1℃
TT-TF3Z-60-1400	200+200+200	Φ60×1200	1400℃	1350℃	380V	8KW	SIC	±1℃
TT-TF3Z-80-1400	200+200+200	Φ80×1200	1400℃	1350℃	380V	9KW	SIC	±1℃
TT-TF3Z-100-1400	200+200+200	Φ100×1200	1400℃	1350℃	380V	12KW	SIC	±1℃

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℃

TORONTECH.com

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Torontech Inc.
251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC
601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE
Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE

Phone: +971 488 19252
Email: me@torontech.com

USA | Canada | EU | UAE | GCC | KSA | India | Africa | Latin America | Asia