TORONTECH

3-ZONE SPLIT TUBE FURNACE 1200°C – TT-TF3Z-168-1200

The 3-Zone Split Tube Furnace 1200°C – TT-TF3Z-168-1200 is engineered for sintering and high-temperature heat treatment of metals, ceramics, nanomaterials, semiconductors, powder metallurgy, and other advanced materials. It is widely used in universities, research institutes, manufacturing facilities, and industries such as petrochemical and aerospace, offering reliable performance for precise thermal processing.

This furnace features a high-purity quartz tube with an outer diameter of Φ168 mm and three independently controlled heating zones, each 300 mm in length. It supports continuous operation at 1100 °C with a maximum temperature of 1200 °C. Powered by 380 V/50 Hz, the furnace uses 1500-type polycrystalline alumina ceramic fiber heating elements and an N-type thermocouple, ensuring uniform heating and precise temperature control for advanced research and industrial applications.

APPLICATIONS

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

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

- **Semiconductor Materials** – Facilitates annealing, diffusion, and oxidation processes for semiconductor substrates at controlled ultra-high temperatures, ensuring reliable results for microelectronics and optoelectronics development.

- **Powder Metallurgy** – Supports high-temperature sintering of metal powders into dense, uniform components, suitable for producing complex shapes and advanced alloys in both research and manufacturing settings.

- **Petrochemical & Chemical Laboratories** – Ideal for catalyst activation, thermal decomposition, and reaction mechanism studies requiring precise temperature control up to 1200°C. Delivers reproducible, high-quality results for chemical research and development.

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

- **Energy & Battery Research** – Provides thermal treatment for energy storage materials, including lithium-ion and solid-state battery components. Maintains consistent high-temperature stability for advanced energy materials research.

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

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

FEATURES

Furnace Shell

- Constructed from Q235 low-carbon steel, the shell features an electrostatically coated surface for excellent corrosion resistance.
- A durable double-layer metal frame is paired with an insulated fan structure, keeping the exterior surface cool during operation.
- Designed for horizontal use, the furnace has a top-opening lid that makes operation simple and convenient.

Refractory Material

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

Heating System

- Features high-quality metal and ceramic heating elements that provide radiant heat throughout the furnace chamber, ensuring energy efficiency and a long operational lifespan.
- Heating is distributed in a ring or dual-side configuration to maintain excellent temperature uniformity.
- Three independently controlled heating zones allow precise temperature management in each section.

Temperature Control Panel

- Equipped with a PID controller and SSR/SCR control system for accurate and stable temperature regulation.
- Includes a standard thermocouple with extended service life, a heating status indicator, and an over-temperature alarm with buzzer for added safety.

Program Controller

- Comes with an advanced controller capable of handling complex thermal processes.
- User-friendly interface with flexible programming options.
- Supports up to 30 programmable segments.
- Integrated safety features include over-temperature and fault alarms with automatic protection functions.

Vacuum and Atmosphere Function

- Includes a 304 stainless steel sealing flange to enable vacuum or gas-controlled environments inside the tube.
- Compatible with high-quality quartz glass, metal, or alumina tubes to meet a wide range of application needs.

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℃

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