



200MM 3-ZONE LARGE DIAMETER TUBE FURNACE - TT-LDTF- 200-1200

200MM 3-Zone Large Diameter Tube Furnace – TT-LDTF-200-1200 features an extended heating zone and precise temperature control, making it ideal for sintering multiple samples or conducting pilot-scale tests.

This model is commonly used in the semiconductor, nanomaterials, carbon fiber, and graphene sectors. It offers an efficient and economical solution for advanced thermal processing.

APPLICATIONS

- **Pilot-Scale Sintering & Heat Treatment** – Supports high-volume sintering and batch thermal processing of advanced materials, including graphene, carbon fibers, lithium-ion battery electrodes, and semiconductors. Provides uniform heating with multi-zone control for reproducible and reliable results.
- **Chemical Vapor Deposition (CVD) & Controlled Atmosphere Processing** – Enables precise thermal treatments under vacuum or inert gas conditions. The three independently controlled zones allow for uniform temperature distribution and thermal gradient experiments, critical for material property optimization.
- **Semiconductor & Nanomaterials Research** – Ideal for annealing, activation, and heat treatment of semiconductor substrates and nanostructures. Delivers precise, programmable temperature profiles for functional nanomaterials research and pilot-scale production.
- **Advanced Materials & Energy Storage** – Facilitates high-temperature processing of materials used in energy storage systems, high-performance composites, and emerging energy technologies. Ensures consistent thermal performance across large-diameter samples.

- **Laboratory & Industrial Applications** – Designed with a top-opening, horizontal furnace body and durable construction for safe and efficient operation. Compatible with quartz, metal, or alumina tubes and supports optional vacuum systems for flexible research and production conditions.
- **Customizable Thermal Processing** – Offers tube diameters from $\Phi 150$ mm to $\Phi 350$ mm with a 900 mm heating zone. Heating elements, power, and control options can be tailored to meet specific process requirements. Multi-zone, programmable PID control supports automated thermal cycles for complex experiments or pilot-scale operations.
- **Safety & Compliance** – Equipped with over-temperature alarms, system fault protection, and circuit breakers to ensure operator and equipment safety. The robust shell and insulation provide minimal heat loss, energy efficiency, and compliance with ISO9001, CE, SGS, and TUV standards.

FEATURES

The 200mm large-diameter tube furnace consists of a heating system, temperature control system, working tube, sealing kit, and an automatic top-opening cover. It supports operation under vacuum or controlled atmosphere, making it suitable for a wide range of CVD process applications. The furnace allows for multiple temperature zones to be configured, ensuring high thermal uniformity and enabling thermal gradient experiments.

This model is frequently used in pilot-scale sintering and batch heat treatment across industries working with graphene materials, lithium battery electrodes, semiconductors, new energy solutions, and advanced materials.

Furnace Shell

- The shell is constructed from Q235 low-carbon steel with an electrostatically applied, corrosion-resistant finish. A robust double-layer metal frame integrates an insulated fan design, helping maintain a low external surface

temperature.

Features a horizontal orientation with a top-opening structure for ease of operation.

Refractory Material

- The furnace features a multi-layer insulation system made from lightweight alumina ceramic fiber and a premium-grade insulation board. It is asbestos-free, offering minimal heat loss and improved energy efficiency.

Heating System

- High-performance metal and ceramic heating elements ensure efficient, radiation-based heat transfer throughout the chamber.
- Configured with ring or dual-side heating for enhanced temperature uniformity.
- Three-zone design with independent control for each zone, improving overall temperature consistency.

Temperature Control Panel

- PID control with SSR/SCR output for accurate temperature regulation
- Durable, internationally standardized thermocouple
- Includes a heating status indicator and over-temperature alarm buzzer

Program Controller

- Advanced controller designed for demanding thermal processes
- User-friendly interface with flexible programming options
- Supports up to 30 programmable segments
- Built-in over-temperature and system fault alarms with automatic safety features

Vacuum and Atmosphere Capability

- Comes with a 304 stainless steel sealing flange to create a vacuum or inert gas environment within the tube
- Compatible with high-quality quartz, metal, or alumina working tubes for adaptability across different process conditions

TECHNICAL SPECIFICATIONS

Model	TT-LDTF-150-1200	TT-LDTF-200-1200	TT-LDTF-280-1200	TT-LDTF-350-1200
Furnace tube size	Φ150×1500mm	Φ200×1500mm	Φ280×1500mm	Φ350×1500mm
Heating zone	900mm	900mm	900mm	900mm
Max temperature	1200℃			
Working temperature	1100℃			
Heating element	HRE high temperature alloy resistance wire			
Chamber material	Polycrystalline inorganic alumina ceramic fiber material prepared by wet vacuum filtration			
Temperature control accuracy	±1℃			
Temperature measuring element	N-type thermocouple			
Temperature control instrument	Intelligent microcomputer PID temperature control instrument, SSR voltage regulation control, PID parameter self-tuning function; programmable 30 program segments, program temperature rise, program heat preservation, program cooling; three-stage partition control			
Heating rate	1-20℃/min free adjustment			
Furnace structure	Furnace temperature control integrated structure			
Standard configuration	Modular control, it will send out sound and light alarm signal for over temperature and broken coupler in the working process, and automatically complete the protection action			
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			
Furnace shell	The shell is processed by high-quality cold-rolled steel sheet CNC machine tools, after welding, grinding, polishing, phosphating, pickling, and electrostatic spraying of plastic powder on the surface			

Quality certification	ISO9001 CE SGS TUV
Standard configuration	1 furnace body 2. Power cord 3 meters 3. 1 piece thermocouple 4. 1 piece manual 5. 1 piece furnace hook 6. One pair of high temperature gloves
Optional	1. Optional rotary vane vacuum pump (vacuum degree $\leq 5\text{pa}$) 2. Optional diffusion pump vacuum unit (vacuum degree $\leq 6.67 \times 10^{-2}\text{pa}$) 3. Optional molecular pump vacuum unit (vacuum degree $\leq 6.67 \times 10^{-4}\text{pa}$) 4. Optional digital vacuum gauge (1.0×10^5 - $1.0 \times 10^{-1}\text{pa}$) 5. Optional float flowmeter (range 100-1000ml/min) 6. Optional quartz boat, metal crucible and other material loading containers
OEM	According to the output requirements of the actual material of the user, the customization of special specifications of the product can be realized



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