



TORONTECH



300MM LARGE DIAMETER TUBE FURNACE - TT-LDTF- 300-1200

The 300MM Large Diameter Tube Furnace – TT-LDTF-300-1200 is designed with a wide tube diameter, an extended constant-temperature zone, and precise temperature control, making it ideal for sintering multiple samples or conducting pilot-scale experiments. This furnace delivers reliable and consistent thermal performance, ensuring uniform heating for a variety of research and industrial applications.

Commonly used in semiconductor research, nanomaterials, carbon fiber, and graphene processing, the TT-LDTF-300-1200 offers a cost-effective solution for advanced thermal processing. It features a $\Phi 300$ mm quartz reactor tube with a 900 mm heating zone, supporting continuous operation at 1100°C and reaching a maximum temperature of 1200°C. Heating is achieved using 1500-type polycrystalline alumina ceramic fiber elements, with temperature monitoring provided by an N-type thermocouple. The system operates on 380V/12 kW, providing efficient and robust performance for laboratory and pilot-scale applications.

APPLICATIONS

- **Semiconductor Research** – Provides precise, uniform thermal treatment for semiconductor wafers and components. Supports processes such as annealing, sintering, and material doping with accurate temperature control up to 1200°C.
- **Nanomaterials & Graphene Processing** – Ideal for sintering and heat treatment of advanced nanomaterials, including graphene and carbon-based structures. Ensures consistent thermal profiles for reproducible material properties.
- **Lithium Battery Materials** – Supports pilot-scale processing of cathode and anode materials for lithium-ion batteries. Maintains uniform heating and gradient temperature capability for material optimization.

- **Advanced Energy & Materials Research** – Enables thermal processing of high-performance ceramics, carbon fibers, and composite materials. Delivers stable high-temperature operation for R&D and production testing.
- **Pilot-Scale Sintering** – Extended constant-temperature zones and multiple independently controlled heating segments allow for efficient batch processing and pilot-scale experiments.
- **Vacuum & Controlled Atmosphere Applications** – Compatible with vacuum and inert gas environments. Supports a wide range of CVD processes and other controlled-atmosphere thermal treatments.
- **Industrial R&D & Process Development** – Provides reliable, high-capacity thermal performance for laboratory and industrial pilot studies. Suitable for new materials testing, small-batch production, and process validation.
- **Quality Assurance & Safety** – Equipped with PID temperature control, high-grade thermocouples, over-temperature protection, and automatic fault shutdown. Meets rigorous standards for consistent performance and operator safety.
- **Universities & Research Institutes** – Suitable for advanced studies in materials science, chemical engineering, and energy research. Offers programmable heating profiles and high-temperature stability for experimental reproducibility.
- **Energy & Cost Efficiency** – Designed with multi-layer insulation, efficient HRE heating elements, and a heat-insulating furnace shell to reduce energy consumption while maintaining uniform temperature distribution.

FEATURES

The large-diameter tube furnace consists of a heating system, temperature control system, working tube, sealing kit, and an automatic lid-opening mechanism. It supports both vacuum and atmosphere environments, making it suitable for a wide range of CVD processes. Multiple temperature zones can be configured to create a highly uniform thermal field and support gradient temperature experiments across various materials.

This furnace is widely used for pilot-scale sintering, as well as processing materials in fields such as graphene, lithium battery electrodes, semiconductors, and advanced energy and materials sectors requiring batch heat treatment.

Furnace Shell

- Constructed from Q235 low-carbon steel with an electrostatic, corrosion-resistant finish
- Durable double-layer metal frame integrated with a heat-insulating fan structure to ensure low surface temperature
- Horizontal configuration with a top-opening design for user-friendly access

Refractory Insulation

- Multi-layer insulation composed of lightweight alumina ceramic fiber and premium insulation board
- Free from asbestos
- Minimizes heat loss and reduces energy usage

Heating System

- Built with high-performance metal and ceramic heating elements that provide radiant heating throughout the chamber
- Energy-efficient design ensures long service life
- Circular or dual-side heating layout for excellent thermal uniformity
- Three-zone heating configuration with independent control for each zone, enhancing temperature consistency

Temperature Control Panel

- PID control with SSR/SCR output for precise thermal regulation
- Uses high-grade thermocouples with extended lifespan

- Includes heating status indicator and over-temperature alarm buzzer

Program Controller

- Capable of handling complex thermal cycles
- User-friendly interface with flexible program configuration
- Supports up to 32 programmable segments
- Safety features include over-temperature alerts and automatic fault protection

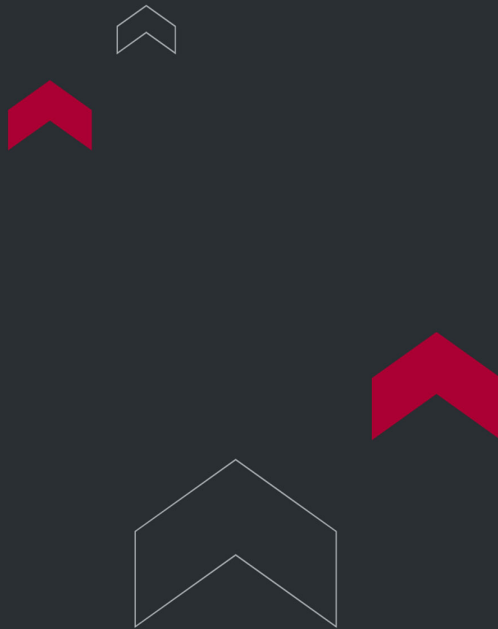
Vacuum and Atmosphere Compatibility

- Fitted with a 304 stainless steel sealing flange for vacuum or gas-filled operation
- Comes standard with a high-quality quartz tube; optional metal or alumina tubes available based on application needs

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°C			
Working temperature	1100°C			
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°C			

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°C/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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