



TORONTECH



HYDROGEN REDUCTION TUBE FURNACE 1700°C - TT-HRTF-60-1700

The Hydrogen Reduction Tube Furnace 1700°C – TT-HRTF-60-1700 is engineered for advanced hydrogen reduction processes requiring high durability and safety. It features a high-quality nickel-based superalloy processing tube, designed to withstand continuous exposure to flowing hydrogen without cracking or breaking. For maximum operational safety, the system is equipped with a 3M hydrogen detector that automatically shuts off the hydrogen gas generator and inlet valve in the event of a leak.

This model is built with a $\Phi 60 \times 1200$ mm quartz tube and a 440 mm heating zone, supporting continuous operation at 1600°C with a maximum temperature capability of 1700°C. The reactor tube is made from durable alumina ceramic, while heating is powered by high-quality HRE alloy resistance wires for stability and long service life. A B-type thermocouple ensures accurate temperature monitoring, and the system operates on 220V/4 kW (110V also available), making it ideal for both laboratory research and industrial-scale hydrogen reduction applications.

APPLICATIONS

Hydrogen Reduction of Metals and Alloys – Specially designed for high-temperature hydrogen reduction processes, the furnace enables refining and purification of metals, alloys, and oxides at up to 1700°C. The nickel-based superalloy tube ensures long-term resistance against hydrogen embrittlement.

Powder Metallurgy & Advanced Materials – Ideal for sintering and reduction of metal powders, allowing the production of high-purity alloys, magnetic materials, and structural components with superior mechanical properties.

Nanomaterials & Catalysts – Supports the hydrogen-assisted synthesis of nanomaterials, catalyst substrates, and advanced functional materials, ensuring controlled particle size, high reactivity, and stability.

Energy & Battery Research – Used for hydrogen treatment of electrode and solid-state electrolyte materials in next-generation energy storage systems. Enhances conductivity, cycle life, and thermal stability of battery components.

Aerospace & High-Performance Industries – Provides reliable hydrogen-based heat treatment for superalloys, ceramic composites, and coatings used in aerospace, defense, and advanced manufacturing sectors.

Research Institutions & Universities – Widely applied in academic and industrial research labs for studies in material science, hydrogen chemistry, nanotechnology, and chemical engineering. The programmable multi-segment controller and high accuracy make it ideal for experiments requiring precise atmosphere and thermal control.

Quality Control & Industrial Certification – Suitable for high-temperature hydrogen testing, durability evaluation, and certification of advanced materials in compliance with ISO9001, CE, SGS, and TÜV standards.

FEATURES

Furnace Shell

- The shell is constructed from Q235 low-carbon steel, featuring an electrostatic-resistant and corrosion-resistant finish. Its solid double-layer metal frame is integrated with a heat-insulating fan structure to maintain a low exterior temperature. The horizontal configuration with a top-opening design allows for easy operation.

Refractory Material

- The furnace features a multi-layer insulation system made of lightweight alumina ceramic fiber and high-quality insulation board. It is asbestos-free, ensuring low heat loss and reduced energy consumption.

Heating System

- The heating element consists of high-quality HRE spiral resistance wire, securely embedded on the inner surface of the chamber. It provides efficient thermal radiation heating, offering energy savings and extended service life.
- Circular resistance wire heating delivers excellent temperature uniformity throughout the furnace.

Temperature Control Panel

- Equipped with advanced controllers capable of handling complex processes.
- Supports programmable control with up to 30 segments for automated temperature profiling.
- Includes over-temperature and fault alarms with automatic safety shutdown features.

Rotary System

- The furnace tube uses a gear-driven electric motor for 360° rotation at speeds between 12–20 RPM, ensuring uniform heating of materials.
- The main body can be tilted electrically, with adjustable tilt angles for smoother material loading and discharge.
- Comes with a 304 stainless steel sealing flange to support vacuum or controlled atmosphere environments within the tube.
- Compatible with high-quality quartz tubes, as well as optional metal or alumina ceramic tubes for various applications.

TECHNICAL SPECIFICATIONS

Model	TT-HRTF-60-1700Q	TT-HRTF-100-1700Q	TT-HRTF-150-1700Q	TT-HRTF-200-1700Q
Reactor Quartz Tube	Φ60×1200mm	Φ100×1200mm	Φ150×1500mm	Φ200×1500mm
Heating Zone Length	440mm	440mm	600mm	600mm
Max Temp	1700℃			
Continue Temp	1600℃			
Heating Element	High quality Molybdenum Disilicide MoSi2 heater			
Chamber Material	Polycrystalline inorganic alumina ceramic fiber materials			
Temp Precision	±1℃			
Thermocouple	N-type national standard platinum rhodium thermocouple			

Temp Controller	Intelligent microcomputer PID temperature control instrument, SSR control, PID parameter self-tuning function; programmable 30 program segments, program temperature rise, program heat preservation, program cooling
Heating Rate	1-20°C/min free adjustment
Furnace Structure	Furnace temperature control integrated structure; double-layer shell, air circulation and heat insulation
Equipment Protection	Modular control, sound and light alarm signal will be sent out for over temperature and broken coupler in the working process, and the protection action will be completed automatically
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	High-quality cold-rolled steel plate CNC machine tool blanking processing, after welding, grinding, polishing, phosphating, pickling, surface electrostatic spraying plastic powder
Certification	ISO9001 CE SGS TUV
The standard configuration	1. furnace body 2. temperature controller 3. Power cord 3 meters 4. 1 thermocouple 5. 1 manual6. One furnace hook 7. One pair of high temperature gloves 8. Two pipe plugs 9. One set of sealing flange



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