



HYDROGEN REDUCTION TUBE FURNACE 1200°C - TT-HRTF-100-1200

The Hydrogen Reduction Tube Furnace 1200°C – TT-HRTF-100-1200 is designed for advanced hydrogen reduction applications requiring high safety and durability. It features a processing tube made from a high-performance nickel-based superalloy, specifically engineered to withstand continuous exposure to flowing hydrogen without cracking or breaking. For added protection, the system is equipped with a 3M hydrogen detector that automatically shuts off both the hydrogen gas generator and the inlet valve in the event of a leak, ensuring maximum operational safety.

This model is built with a $\Phi 100 \times 1200$ mm quartz tube and a 440 mm heating zone. It supports continuous operation at 1100°C, with a maximum temperature capability of 1200°C. The reactor tube is constructed from durable alumina ceramic, while heating is provided by high-quality HRE alloy resistance wires for long service life and stable performance. A B-type thermocouple ensures accurate temperature monitoring, and the system operates on 220V/4 kW (with 110V available), making it suitable for both laboratory research and industrial-scale hydrogen reduction processes.

APPLICATIONS

Hydrogen Reduction Applications – Specifically designed for hydrogen reduction of metals, alloys, and oxides at high temperatures. The nickel-based superalloy tube ensures safe and continuous hydrogen processing without risk of cracking or degradation.

Powder Metallurgy & Metal Processing – Ideal for hydrogen-based sintering and refining of metal powders, enabling the production of high-purity alloys, functional metals, and specialized components.

Nanomaterials & Catalysts – Supports the reduction and synthesis of nanomaterials, catalysts, and functional materials under controlled hydrogen atmospheres, ensuring uniform particle properties and high material performance.

Energy & Battery Materials – Enables the hydrogen treatment of electrode and electrolyte materials for next-generation batteries, improving conductivity, thermal stability, and cycle life.

Aerospace & High-Performance Materials – Provides hydrogen reduction and thermal treatment of superalloys, coatings, and composites used in aerospace, defense, and advanced manufacturing industries.

Research & Academic Laboratories – Widely used in universities and research institutions for studies in hydrogen chemistry, material science, nanotechnology, and chemical engineering. Offers programmable control, precise temperature accuracy, and strong safety features.

Quality Control & Industrial Certification – Suitable for high-temperature hydrogen testing and certification of materials in compliance with ISO9001, CE, SGS, and TÜV standards, supporting industrial quality assurance and product validation.

FEATURES

Furnace Shell

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

Refractory Material

- The furnace utilizes a multi-layer insulation system made from lightweight alumina ceramic fiber and premium insulation board. It is asbestos-free, offering low heat loss and reduced energy consumption.

Heating System

- The furnace is equipped with high-grade HRE spiral resistance wire elements, securely embedded along the inner surface for efficient thermal radiation heating. This configuration promotes energy efficiency and ensures a long service life.
- Ring-type resistance wire heating provides uniform temperature distribution throughout the chamber.

Temperature Control Panel

- Features an advanced controller capable of handling complex heating processes.
- Supports up to 30 programmable segments for automated temperature curve control.
- Includes over-temperature and system fault alarms with automatic safety shutdown.

Rotary System

- The tube rotates 360° using a gear-driven electric motor at 12-20 rpm, ensuring even heat distribution inside the tube.
- The furnace body can be electrically tilted with an adjustable angle for smooth material loading and unloading.
- Comes with a 304 stainless steel sealing flange, allowing operation under vacuum or controlled atmosphere conditions.
- Compatible with high-quality quartz tubes, as well as optional metal or alumina ceramic tubes to meet various application needs.

TECHNICAL SPECIFICATIONS

Model	TT-HRTF-60-1200Q	TT-HRTF-100-1200Q	TT-HRTF-150-1200Q	TT-HRTF-200-1200Q
Reactor Quartz Tube	Φ60×1200mm	Φ100×1200mm	Φ150×1500mm	Φ200×1500mm
Heating Zone Length	440mm	440mm	600mm	600mm
Max Temp	1200℃			
Continue Temp	1100℃			
Heating Element	High quality Alloy Resistance Wire□ HRE□			
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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