SYNHTE PRODUCT TECHNICAL GUIDE

HQH-1200 Hydrogen Atmosphere Tube Furnace

Reference configuration for controlled hydrogen, nitrogen or argon heat treatment and sintering.

From published reference data to an application-matched furnace specification.

1100°C	Ø480×600 mm	±1°C	12 kW
Continuous operation	Tube reference	Control accuracy	Heating power

Use this document to	Screen the application, compare reference configurations, identify the engineering variables that change the proposal, and define measurable quotation and acceptance inputs.
Current online reference	https://syn-v2.com/vacuum-sintering-furnace/atmosphere-tube-furnace-for-hydrogen-heat-treatment-sintering/

All published values are reference data for preliminary selection. Final configuration, supply scope and acceptance conditions are controlled by the project proposal and technical agreement.

SYNHTE APPLICATION-LED ENGINEERING

01 / APPLICATION

Application fit and process boundary

Use the furnace family as a starting point. The correct configuration is determined by material, complete loaded geometry, process result, throughput and measurable acceptance evidence.

Application 01

Hydrogen, nitrogen or argon heat treatment

Application 02

Powder, metal and compatible material sintering

Application 03

Processes requiring defined tube flow and purge logic

Application 04

Development and production routes with controlled gas composition

Typical process route

01	02	03	04	05
Load & seal	**Evacuate / purge**	**Process gas**	**Heat & hold**	**Safe cool / purge**
Boat, tube and seal inspection	Remove air through the agreed safe sequence	Establish purity, flow and pressure	Controlled zoned thermal cycle	Remove hydrogen before opening

Stage	Primary control	RFQ / qualification question
Load & seal	Boat, tube and seal inspection	Define input, control limit and evidence owner
Evacuate / purge	Remove air through the agreed safe sequence	Define input, control limit and evidence owner
Process gas	Establish purity, flow and pressure	Define input, control limit and evidence owner
Heat & hold	Controlled zoned thermal cycle	Define input, control limit and evidence owner
Safe cool / purge	Remove hydrogen before opening	Define input, control limit and evidence owner

Suitable when

Hydrogen safety requirements are configuration inputs | Gas train, exhaust and controls must be reviewed with the installation site | The usable hot zone is qualified together with the loaded boat

Re-check the route when

Hydrogen service should not be quoted from temperature and tube size alone | Site ventilation, gas detection and exhaust boundaries must be confirmed before release

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02 / ENGINEERING

System architecture and sizing logic

SYNHTE reviews the furnace as a connected process system. Each subsystem is selected against the same loaded cycle and acceptance plan.

Subsystem	Engineering scope	Input that changes the choice
Process chamber	Usable zone, orientation, door/loading route and service clearances	Largest complete production load and site access
Hot zone	Heating material, insulation/shielding, zones and sensor arrangement	Temperature, chemistry, contamination and survey basis
Vacuum / gas	Pump train, valves, gauges, purge/backfill and process-gas control	Pressure range, outgassing, gas purity and cycle time
Cooling / quench	High-pressure gas circuit, controlled oil route, programmed cooling or natural/assisted cooling as applicable	Target metallurgical result, load density and utilities
Handling / tooling	Tray, fixture, setter, basket, carrier or press interface	Drawing, mass, center of gravity and repeatability
Controls & records	PLC/HMI recipes, interlocks, alarms, trends and batch identity	User roles, data fields, protocols and retention
Installation	Electrical, water, gas, exhaust, floor/loading and maintenance boundary	Site utility data and local safety requirements

Four engineering decisions that should stay connected

Gas basis

Composition, purity, dew point, flow and supply pressure

Safety basis

Purge volume, exhaust, detection and ventilation

Tube/load

Envelope, boat, seals and pressure boundary

Controls

Interlocks, alarms, permissives and records

SYNHTE project path

Application review → configuration and utility definition → technical agreement → manufacturing and assembly → FAT / documentation → installation, SAT and process handover as agreed in the project scope.

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03 / REFERENCE DATA

Published configuration envelope

Gas purity, flow, purge sequence, exhaust, detection, ventilation and applicable site safety requirements must be defined before configuration release.

Parameter	HQH-1200 reference
Continuous temperature	1100°C
Effective work chamber	450 × 500 mm
Retort / tube	Ø480 mm; 600 mm effective length
Ultimate vacuum	10 Pa
Control accuracy	±1°C
Heating zones	2 zones; 300 mm each
Atmosphere	H□ / N□ / Ar; mixture options
Electrical supply	220 / 380 V adapted to site

How to read the table

The usable work zone must contain parts, fixtures, trays/setters, transfer clearance and the qualified sensor arrangement. Reference load is not a substitute for a gross loaded drawing. Vacuum, temperature and cooling values require an agreed test condition.

What changes the final configuration

Option / feature	Selection trigger	Engineering impact
Rotameter or optional MFC gas control	Material chemistry or contamination requirement	Changes heater/shielding compatibility and maximum useful temperature
7-inch touchscreen and dual-zone control	Pump-down, cleanliness or working-pressure target	Changes pump train, gauges, isolation and acceptance tests
Vacuum pump and water-chiller package	Load geometry, orientation or factory handling	Changes chamber orientation, tooling and clearances
Custom retort, tube and installation dimensions	Cooling result, cycle time or surface requirement	Changes gas/oil/water duty and heat-rejection design

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04 / QUALIFICATION

RFQ, proposal and acceptance framework

A precise enquiry reduces redesign and makes supplier proposals comparable. Attach drawings and define the pass/fail method wherever possible.

Input block	Information to provide	Preferred evidence
Material / process	Material, load boat and tube-compatible envelope	Drawing, value, method or standard
Part / tooling	Gas composition, purity, flow and dew point	Drawing, value, method or standard
Cycle / atmosphere	Temperature and residence profile	Drawing, value, method or standard
Production	Purge/exhaust and hydrogen safety basis	Drawing, value, method or standard
Site / utilities	Electrical, cooling and ventilation utilities	Drawing, value, method or standard
Quality / records	Process result, records and FAT/SAT acceptance	Drawing, value, method or standard

Recommended acceptance evidence

Thermal

Defined survey or loaded-cycle evidence, sensor locations and allowable deviation

Vacuum / atmosphere

Pump-down, ultimate/working pressure, pressure-rise or gas condition under stated test conditions

Functional

Recipes, interlocks, alarms, manual recovery and agreed utility-loss cases

Process result

Witness-load or sample evidence using agreed hardness, leak, density, dimensional, joint or metallographic methods

Documentation

Approved drawing, utilities, manuals, component list, records and test reports in the agreed scope

Site

Installation boundary, SAT checks, training and open-item closure responsibility

Direct engineering contact

Email info@synthe-corp.com or WhatsApp +86 155 3785 7393. Include this document title and the current product page: https://syn-v2.com/vacuum-sintering-furnace/atmosphere-tube-furnace-for-hydrogen-heat-treatment-sintering/

Henan Synthe Corporation | Building 12, Shangwu Waihuan Road, Zhengzhou City, Henan Province, China

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