

• HAST CHAMBER SERIES

HAST CHAMBER



HIGHLY ACCELERATED STRESS TEST CHAMBER

The HAST Chamber is engineered for rapid, repeatable thermal cycling from deep cryogenic cold to high-temperature extremes — built for R&D labs, QA floors and reliability test houses.

MODEL NO.	TEMP. RANGE	RAMP RATE
HCTA-1	-70° to +300°C	1°C / sec

Product Overview

The **HAST Chamber (Model HCTA-1)** is designed to take test samples through the full thermal stress envelope — from deep sub-zero cold to high-temperature exposure — in a single continuous cycle. A cryogenic refrigeration circuit combined with a high-output heating system allows the chamber to hold a 1°C/second ramp rate across the entire range, compressing test schedules that would otherwise take hours into minutes.

Thermal Range Coverage

MINIMUM	MAXIMUM	RAMP RATE
-70°C	+300°C	1°C/sec

CAPACITY 64 Litres Usable chamber volume	INTERNAL SIZE 400×400×400 mm Working volume	RAMP RATE 1°C / sec Guaranteed across range
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Why a HAST Chamber

A HAST Chamber like the HCTA-1 lets engineers simulate real-world thermal extremes inside a controlled lab environment — qualifying components for the hot summers, cold storage, high-altitude and rapid-cycling conditions they will actually face in the field, without waiting for those conditions to occur naturally.

At A Glance

HAST CHAMBER	CRYOGENIC COOLING	PLC + TOUCHSCREEN HMI
SS304 INNER CHAMBER	CASTOR WHEEL BASE	VIEWING WINDOW

02 Construction Details

The HCTA-1 is built as a double-wall chamber with a fully insulated cavity between an SS304 inner liner and a powder-coated outer shell, mounted on a mobile, castor-fitted base for easy repositioning on the lab floor.

INSULATED CAVITY WALLS

HEAVY-DUTY GASKET

SS SHELF RACK

Door & Access

- ✓ Hinged door with silicone gasket seal to hold set-point temperature under repeated cycling.
- ✓ Heated viewing window (anti-fog) for visual monitoring of the sample without opening the door.
- ✓ Door safety interlock switch cuts heating/cooling if opened mid-cycle.
- ✓ Mobile base on lockable castor wheels for easy repositioning on the lab floor.

03 Fabrication

Every HAST Chamber starts on the NSW India works floor as precision-fabricated sheet metal — chamber body, door frame, panel enclosures and mounting brackets, cut, welded and assembled in-house before moving to insulation and system integration.

PRECISION SHEET METAL

IN-HOUSE WELDING

RIGID FRAME ASSEMBLY

QUALITY-CHECKED HARDWARE

Heating System (Up to +300°C)

High-performance finned tubular heaters paired with forced-air circulation deliver precise temperature control up to +300°C on the HAST Chamber, holding the 1°C/second ramp rate the chamber is built around, with safety, efficiency and reliability designed in.

FINNED TUBULAR HEATERS

FORCED-AIR CIRCULATION

SCR POWER CONTROL

OVER-TEMPERATURE CUTOFF

Refrigeration (Cryogenic)

The HAST Chamber's cold side runs on an advanced cascade cryogenic refrigeration system for ultra-low temperature performance, reaching -70°C with high efficiency, reliability and built-in safety protection.

CASCADE CRYOGENIC COMPRESSORS

COLD BOX HEAT EXCHANGER

IN-CHAMBER EVAPORATOR COIL

LOW-PRESSURE CUTOFF

06 Temperature Controller

The HAST Chamber runs on an advanced Delta HMI paired with a high-performance controller for precise temperature control from -70°C to $+300^{\circ}\text{C}$, ensuring accuracy, stability and reliability through every cycle.

COLOUR TOUCHSCREEN HMI

MULTI-STEP RAMP / SOAK

REAL-TIME TREND & ALARM LOG

PASSWORD-PROTECTED ACCESS

Additional Features & Safety

Beyond fabrication, refrigeration, heating and control, the HCTA-1 carries a full set of protective systems and convenience features to keep operators, samples and the chamber itself safe through demanding, repeated test cycles.

Over-Temperature Protection Independent high-limit thermostat protects the chamber and sample if the controller loop fails.	Door Safety Interlock Heating/cooling suspends automatically if the door is opened mid-cycle.
Earth Leakage Protection ELCB/RCCB protection on the incoming supply for operator safety.	Low-Refrigerant Cutout Pressure switch halts the compressor if refrigerant charge falls outside safe limits.
Audible & Visual Alarms On-screen and audible alerts for deviation, cycle completion and fault conditions.	Calibration Support Calibration assistance and test certificates available at commissioning.
Password-Protected Access Multi-level login on the HMI keeps calibration and profile settings safe from accidental changes.	Trend & Data Logging Live temperature-trend graphing with logged cycle data for traceability and reporting.
Emergency Stop Dedicated E-stop button on the control panel for immediate shutdown in an emergency.	

Optional Accessories

- ✓ Additional perforated shelves for multi-sample loading.
- ✓ PC-based SCADA / data-logging software with USB / Ethernet export.
- ✓ Extra cable pass-through ports for external instrumentation.
- ✓ Remote monitoring / alarm-notification module.
- ✓ Custom chamber sizes and non-standard voltage configurations on request.

08 Applications

01 Electronics & semiconductor component reliability testing	02 Aerospace & defence component qualification
03 Automotive parts & PCB thermal stress testing	04 Material science & university R&D laboratories
05 Battery & energy-storage cell testing	06 Industrial QA / production-line sample testing
07 Connector, cable & polymer material qualification	08 Pharmaceutical & packaging stability studies

Why Choose NSW India

- ✓ In-house design and manufacturing since 1958 — full control over build quality, from fabrication to final control-panel wiring.
- ✓ Application engineering support to match the chamber to your test standard.
- ✓ Custom sizing, controller features and voltage configurations on request.
- ✓ Installation, calibration assistance and after-sales spares support.
- ✓ Direct manufacturer pricing with no middlemen mark-up.

Every HCTA-1 chamber is backed directly by the NSW India works team — the same people who fabricate, wire and test it before dispatch are available for post-installation support.

Technical Specifications

GENERAL	
Catalogue No.	NSW-152-HT
Model No.	HCTA-1
Chamber Type	HAST Chamber — Highly Accelerated Stress Test series
PERFORMANCE	
Temperature Range	–70°C to +300°C
Ramp Rate	1°C / second (average, across full range)
Temperature Uniformity	Within ±1°C at set point (empty chamber, steady state)

Temperature Fluctuation	±0.5°C at set point
CHAMBER DIMENSIONS	
Working Chamber Capacity	64 Litres
Internal Size (W × D × H)	400 × 400 × 400 mm
Chamber Interior	SS304 stainless steel, mirror/matt finish
Chamber Exterior	MS powder-coated sheet metal body
REFRIGERATION & HEATING	
Cooling System	Cryogenic Refrigeration (Cascade System)
Heating System	Finned tubular heaters with forced-air circulation, up to +300°C
Air Circulation	Centrifugal blower with balanced supply/return ducting
CONTROL & ELECTRICALS	
Controller	PLC-based control with colour touchscreen HMI
Programmability	Multi-step ramp / soak profiles with on-screen graphing
Monitoring	Real-time PV/SV readout, temperature trend, alarm log
Power Supply	415V ± 10%, 3 Phase, 50 Hz (AC)
CONSTRUCTION	
Insulation	High-density PUF / rockwool insulation, full chamber wrap
Door	Hinged, gasket-sealed, viewing window with interlock switch
Base / Mounting	Powder-coated stand on lockable castor wheels

Specifications are for the standard HCTA-1 configuration. NSW India can customise chamber size, controller features and mounting to suit a specific test standard on request.

