

EXTENSIVE CATALOGUE: THERMAL CHAMBERS FOR LABORATORY & R&D INSTITUTIONS

SJ Industrial Ovens is a premier supplier of highly precise and reliable thermal equipment designed specifically for scientific experimentation, academic research, and pilot-scale process validation. Our chambers and ovens offer the utmost control over temperature uniformity, atmosphere, and time profiles, enabling repeatable results and robust data integrity essential for certification and breakthrough innovation.

SECTION 1: HIGH-CAPACITY & ENVIRONMENTAL TESTING

1. Custom Walk-In Temperature Chambers

Application Focus: Large-scale process simulation, curing of composite parts (aerospace, wind energy), thermal testing of full assemblies, and pilot-scale production validation.

Technical Capabilities: These chambers are custom-built to customer specifications, offering enormous internal volumes while maintaining industrial-grade precision. They eliminate the need to outsource large part processing.

Key Features & Specifications

- Temperature Uniformity Survey (TUS):** Capable of meeting stringent aerospace and industrial standards (e.g., $\pm 5^{\circ}\text{C}$) across the entire working volume.
- Load Handling:** Reinforced, insulated flooring and heavy-duty tracks for effortless loading of heavy components via cart or forklift.
- Atmosphere Options:** Integration of vacuum pump ports and complex manifold systems for vacuum bagging or inert gas purging during composite curing cycles.
- Control:** Advanced PLC/HMI system with multi-stage profiling for complex ramp, soak, and cooling recipes.

Typical Temp Range: Ambient to 350°C | Custom Volumes: Up to 5000+ Cubic Feet | Construction: Welded Steel Plate, modular design.

SECTION 2: VACUUM, PURITY, AND ATMOSPHERE CONTROL

2. Precision Vacuum Ovens (High-Vacuum & Inert Gas)

Application Focus: Outgassing materials for space or high-vacuum use, high-purity component drying, solvent removal, and low-temperature thermal processing to prevent oxidation.

3. Specialized Burn-In & Testing Chambers

Application Focus: Accelerated Life Testing (ALT) for electronic components, high-density power cycling, and controlled aging of materials under continuous thermal load.

Purpose: To intentionally stress test samples under controlled high temperatures over

Core Principle: Drying and curing under vacuum significantly lowers the boiling point of solvents and moisture, allowing for rapid and complete removal at temperatures that would otherwise damage the material.

Essential Technical Features

- **Vacuum Capability:** Dual-stage pump compatibility for achieving deep vacuum levels (e.g., down to 0.1 Torr or lower).
- **Contamination Control:** **Non-contaminating interior** constructed entirely of **SS304/SS316**, with mirror finish to prevent particle generation.
- **Gas Flow Control:** Integrated inlets and precise metering valves for continuous or pulse **Inert Gas Purging** (N₂, Argon).
- **Shelving:** Heated, high-mass aluminum shelving for superior heat transfer to the sample under vacuum.

Temp Range: Ambient to 250°C | Vacuum Level: Down to 0.1 Torr | Atmosphere: Vacuum or N₂/Ar Purge.

extended periods to identify early failures (Infant Mortality) and estimate product lifespan.

Advanced Control Features

- **Access Ports:** Multiple sealed access ports for running thermocouple leads, power cables, and sensor lines into the chamber without compromising uniformity.
- **Data Acquisition:** Built-in network ports and internal logging memory for capturing temperature, time, and test data for compliance documentation.
- **Security:** Multi-level access controls to protect proprietary research cycles and data.
- **Uniformity:** Superior airflow designs to ensure consistent thermal exposure to tightly packed circuit boards or component loads.

Temp Range: 50°C to 300°C | Control: PID Autotune, Multi-step Recipe Programming (Ramp/Soak).

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Precision Thermal Equipment for Research & Development and Quality Control

SECTION 3: HIGH-TEMPERATURE & RAPID THERMAL PROCESSING

4. Infrared (IR) Testing Ovens & Tunnels

Application Focus: Surface heating studies, rapid curing of specialized coatings and adhesives, and simulation of non-contact heat sources (e.g., welding pre-heat or rapid curing).