Roch™
Mechatronics Inc

Delivering Quality Solutions with Global Trust and Engineering Expertise.











rochmechatronics.com

At Roch Mechatronics Inc., we understand the importance of preserving seed viability, genetic integrity, and germination potential through precisely controlled storage conditions. Our Seed Storage Chambers are engineered to provide accurate temperature and humidity control, making them ideal for seed banks, agricultural research institutes, breeding centers, biotechnology laboratories, universities, and germplasm conservation facilities.

Designed with advanced refrigeration technology, precision humidity control, and intelligent microprocessor-based controllers, our chambers maintain stable environmental conditions that protect valuable seed collections while ensuring energy-efficient and reliable operation. High-density insulated panels, stainless steel interiors, redundant refrigeration systems, and advanced monitoring features ensure consistent performance and long-term durability.

Every Seed Storage Chamber is manufactured under a rigorous quality management process, from engineering and fabrication to testing and final inspection, ensuring superior reliability and compliance with international quality standards.

With a commitment to innovation, quality, and customer satisfaction, Roch Mechatronics Inc. delivers dependable Seed Storage Chambers that help agricultural and research organizations preserve valuable genetic resources, maintain seed quality, and support sustainable agriculture through precision-controlled storage solutions.

Quality and reliability are at the core of every Weathering Simulator manufactured by ROCH Mechatronics. Designed for accurate and repeatable environmental testing, our systems are built to meet international quality and safety standards.

Certifications & Compliance

- ISO 9001-2015 Certified Quality Management System
- CE Certified for Safety and Compliance
- GMP-Compliant Manufacturing Practices
- Adherence to International Weathering and Environmental Testing Standards
- MSME Registered Manufacturing Enterprise

Awards & Recognition

- Innovation in Environmental Testing Solutions
- Trusted Supplier of Advanced Testing Chambers
- Excellence in Scientific Equipment Manufacturing and Export
- Emerging Leader in Durability Testing Technologies

Through advanced engineering and strict quality control, ROCH Mechatronics delivers reliable Weathering Simulators for product durability testing, research, and quality assurance applications worldwide



SEED STORAGE CHAMBER

Make: **Roch Mechatronics Inc**

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SEED STORAGE CHAMBER

The Seed Growth Chamber from Roch Mechatronics Inc. is a precision-engineered environmental simulation system designed to provide controlled conditions for seed germination, plant growth, tissue culture, and agricultural research. By accurately regulating temperature, humidity, lighting, and air circulation, the chamber creates a stable environment that supports consistent plant development and reliable experimental results.

Designed for research institutions, agricultural universities, seed testing laboratories, biotechnology facilities, and plant breeding centers, the chamber features advanced microprocessor-based controls, programmable growth cycles, energy-efficient LED lighting, and uniform environmental distribution throughout the workspace. High-quality insulated construction and intelligent monitoring systems ensure long-term operational reliability while minimizing energy consumption.

Our Seed Growth Chambers are ideal for studies involving seed germination, crop improvement, plant physiology, genetic research, and environmental stress testing. With user-friendly operation, robust safety features, and customizable configurations, they provide researchers with the precision and flexibility required for a wide range of scientific and agricultural applications.

Manufactured using premium-quality materials and engineered to meet international standards, Roch Mechatronics Inc. Seed Growth Chambers deliver exceptional performance, reproducibility, and durability, making them the preferred choice for modern plant research and controlled-environment agriculture.

PRODUCT FEATURES

- **Precise Environmental Control –** Maintains accurate temperature, humidity, and lighting conditions for consistent plant growth and seed germination.

- **Programmable Growth Cycles –** User-friendly microprocessor-based controller allows programming of day/night temperature, humidity, and lighting schedules.

- **Uniform Air Circulation –** High-efficiency airflow system ensures uniform distribution of temperature and humidity throughout the chamber.

- **Energy-Efficient LED Lighting –** Full-spectrum LED lighting simulates natural sunlight, promoting healthy plant development while reducing energy consumption.

- **Advanced Touchscreen Controller –** Intuitive color touchscreen interface with real-time monitoring, data logging, and programmable operation.

- **High-Quality Insulation –** PUF insulated panels minimize heat loss and improve temperature stability and energy efficiency.

- **Stainless Steel Interior –** Corrosion-resistant SS 304 interior provides durability, easy cleaning, and long service life.

- **Adjustable Shelving System –** Modular stainless-steel shelves can be repositioned to accommodate different plant heights and experimental setups.

- **Data Logging & Connectivity –** Integrated data recording with USB/Ethernet connectivity for exporting operational data and remote monitoring.

- **Comprehensive Safety Features –** Includes over-temperature protection, sensor failure alarms, power failure recovery, and audible/visual alarm notifications.

PRODUCT FEATURES

- **Wide Range of Applications** – Suitable for seed germination, plant growth studies, tissue culture, crop breeding, plant physiology, biotechnology, and agricultural research.

- **Robust Industrial Construction** – Designed for continuous operation with reliable performance and compliance with international quality standards.

PRODUCT APPLCATIONS

- **Seed Germination Studies** – Evaluation of seed germination under controlled temperature, humidity, and lighting conditions.
- **Plant Growth Research** – Controlled cultivation of plants for physiological and developmental studies.
- **Agricultural Research** – Crop improvement, breeding programs, and agronomic experiments.
- **Seed Testing Laboratories** – Germination, vigor, and viability testing in accordance with standard testing protocols.
- **Plant Breeding Programs** – Development and evaluation of improved crop varieties under reproducible environmental conditions.
- **Biotechnology & Tissue Culture** – Growth of plant tissues and cultures requiring precise climatic control.
- **Plant Physiology Studies** – Investigation of plant responses to environmental factors such as temperature, humidity, and photoperiod.
- **Stress and Climate Simulation** – Assessment of plant performance under controlled abiotic stress conditions, including heat, cold, and drought simulations.
- **Universities & Research Institutions** – Academic research, teaching, and experimental studies in plant sciences and agriculture.
- **Horticulture & Floriculture** – Controlled cultivation of ornamental plants, flowers, and horticultural crops.

PRODUCT APPLCATIONS

- **Forestry & Conservation Research** – Propagation and conservation of forestry species and endangered plants.

- **Genetic & Molecular Biology Research** – Controlled growth environments for genetic, genomic, and molecular plant studies.

- **Controlled Environment Agriculture (CEA)** – Research and development for vertical farming, indoor agriculture, and precision farming technologies.

- **Pharmaceutical & Botanical Research** – Cultivation of medicinal and aromatic plants for scientific and commercial research.

- **Environmental & Climate Change Studies** – Simulation of various climatic conditions to study plant adaptation and environmental responses.

- Ensures uniform and reliable seed germination.
- Provides precise control of temperature, humidity, and lighting.
- Promotes healthy and accelerated plant growth.
- Delivers accurate and repeatable research results.
- Supports year-round research and cultivation.
- Reduces energy consumption with efficient operation.
- Simplifies operation through automated controls and monitoring.
- Protects valuable samples with advanced safety features.
- Offers flexible configurations for diverse research applications.
- Built with durable, low-maintenance, and long-lasting components.

BENEFITS

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WORKING PRINCIPLE

The Seed Growth Chamber operates by creating a precisely controlled environment that simulates natural climatic conditions essential for seed germination and plant growth. An advanced micro-processor-based controller continuously monitors and regulates key environmental parameters, including temperature, humidity, lighting, and air circulation, to maintain stable and uniform conditions throughout the chamber.

A high-performance heating and refrigeration system accurately controls the internal temperature, while the humidification and dehumidification system maintains the desired relative humidity. Full-spectrum LED lighting replicates natural daylight cycles with programmable photoperiods, providing optimal illumination for different stages of plant development. Additionally, a forced-air circulation system ensures uniform distribution of conditioned air, eliminating temperature and humidity variations within the chamber.

The integrated control system continuously monitors environmental conditions through precision sensors and automatically adjusts operating parameters to maintain the set values. This intelligent and programmable operation provides a consistent and reproducible growth environment, enabling reliable seed germination, healthy plant development, and accurate research results for agricultural, biotechnology, and plant science applications.

TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION
Chamber Configuration	Two independent walk-in storage chambers
Internal Dimensions (Each Chamber)	12,850 mm (L) × 2,600 mm (W) × 2,450 mm (H)
Storage Temperature	4 ± 2°C
Relative Humidity	30% – 50% RH
Temperature Uniformity	≤ ±2°C
Humidity Accuracy	±3% RH
Humidity Sensor	High-precision Capacitive Humidity Sensor
Temperature Sensor	Shielded Pt100 Resistance Temperature Detector (RTD)
Dehumidification System	Chemical Dryer with 100% Redundancy
Refrigeration System	100% Redundant Air-Cooled Scroll Compressor System
Condenser Type	Multi-Circuit Remote Outdoor Air-Cooled Condenser
Cooling Control	Hot Gas Bypass with Eco Mode Operation
Air Circulation	Ceiling-Suspended Forced Air Recirculation System
Controller	Dual Redundant 7-inch Programmable Touchscreen Controller
Controller Resolution	< 0.1°C (Temperature), 1% RH (Humidity)
Temperature Set Range	0°C to 20°C
Humidity Set Range	30% to 50% RH
Controller Features	USB Data Export, Remote Monitoring, Web Interface, Data Logging, Programmable Operation

TECHNICAL SPECIFICATIONS

Data Recording	Temperature & Alarm Logging up to 1 Year
Remote Connectivity	USB Host, Ethernet, Remote Parameter Modification
Alarm System	Visual & Audible Alarms, Email Notification, Personnel Safety Alarm
Performance Monitoring	Cooling Demand Performance Meter & Pressure Transducer Diagnostics
Power Backup	Online UPS for Continuous Controller Operation
Exterior Construction	100 mm PUF Panels with 0.5 mm Pre-Painted Steel Sheet
Interior Construction	SS 304 Stainless Steel, 0.5 mm Thick
Insulation	100 mm High-Density Rigid Polyurethane Foam (PUF)
Door Type	Single Swing Insulated Door with Viewing Glass, Lock & Key, Sweeping Gasket
Flooring	Heavy-Duty Aluminum Chequered Plate
Lighting	Interior Lighting with External Switch
Shelving System	Four SS 304 Electro-Polished Adjustable Wire Racks (3-Tier)
Shelf Dimensions	4 ft (W) × 2 ft (D) × 6 ft (H)
Shelf Material	SS 304 Electro-Polished Wire (6/4/3 mm)
Shelf Adjustment	1-inch Increment using ABS Plastic Sleeves
Shelf Features	Height Adjustable with Leveling Feet
Safety Protection	Over-Temperature Protection, Motor Overload Protection, Fuse Protection
Operating Ambient Temperature	20°C to 35°C
Operating Ambient Humidity	≤75% RH
Power Supply	AC 400 ±10 V, 3-Phase + Ground
Maximum Power Consumption	60 kW Total (Maximum 35 A per Unit)
Frequency	50 ±0.5 Hz
Compliance Features	Preventive Diagnostics, Programmable Control, HACCP PDF Reporting, BIOS Upgrade Support

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