Carbon Arc Test Chamber

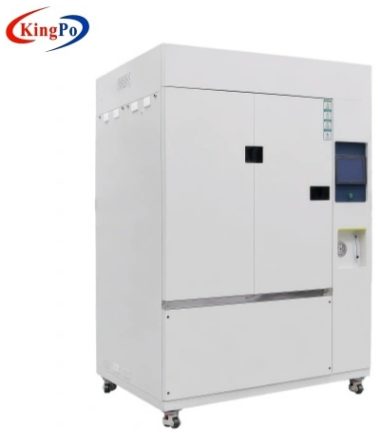
ASTM G23 carbon arc lamp weathering test equipment for accelerated material aging, color stability, cracking, embrittlement and durability evaluation under simulated light, heat and

Sunshine Carbon Arc Lamp | 40-70 °C Chamber Range | 50±5% RH Control | PLC Touchscreen

Light source	Black panel temp.	Spray modes	Inner tank
Open flame carbon arc	63±3 °C / 83±3 °C	Dry / general rain / heavy rain	SUS304 stainless steel

Product Overview and Value Proposition

The KingPo Carbon Arc Test Chamber uses sunshine carbon arc lamps to reproduce the combined aging effects of sunlight, heat and moisture. It is built for accelerated weathering evaluation of non-metallic materials such as plastics, rubber, coatings, paints, textiles and automotive parts. The system supports routine quality control, R&D; comparison, and pre-compliance screening where repeatable laboratory aging cycles are required.



Light + Heat + Moisture

accelerated aging stress

1 Repeatable weathering cycles

Programmable exposure, temperature, humidity and spray operation help laboratories create consistent artificial aging conditions.

2 Industrial-grade chamber body

SUS304 stainless inner tank and insulated construction support long-term use in demanding material test environments.

3 Closed-loop operation

PLC touchscreen control and automatic adjustment improve usability for daily laboratory testing and cycle management.

4 Cost-effective carbon arc method

Suitable for traditional carbon arc weathering tests and routine material screening compared with more complex light-aging systems.

Where This Chamber Fits

Designed for laboratories that need to evaluate fading, yellowing, cracking, chalking, embrittlement, tensile strength loss and other aging indicators under accelerated light, heat and moisture exposure. Typical users include material manufacturers, automotive component suppliers, coating labs, textile testing centers and product reliability teams.

Material R&D | Quality Control | Automotive Materials | Textile & Coating Labs

Technical Parameters

Parameter	Specification	Remark / Notes
Light Source	Sunshine carbon arc lamp	Open flame carbon arc type
Black Panel Temperature	63±3 °C or 83±3 °C	Standard weathering temperatures
Chamber Temperature	40-70 °C	Adjustable range
Humidity	50±5% RH	At 63±3 °C black panel temperature
Spray Cycle	Programmable dry / general rain / heavy rain	Multiple rainfall modes available
Spray Volume	2.10±0.10 L/min	At 1.0 kgf/cm2 nozzle pressure
Test Cycle Duration	Up to 60 hours	4 sets of carbon rods per cycle
Inner Chamber Material	SUS304 stainless steel	Corrosion-resistant structure
Control System	PLC touchscreen with closed-loop control	Automatic parameter adjustment
Temperature Control	Electric control gate	Precise intake / exhaust balancing
Safety Functions	UV protection window; power failure memory	Designed for safer laboratory operation

Standard System Configuration

- Carbon arc weathering chamber body
- Sunshine carbon arc lamp system and carbon rod support
- Black panel temperature monitoring and chamber temperature control
- Humidity and programmable spray/rainfall system
- PLC touchscreen operating interface
- SUS304 stainless steel inner tank and insulated enclosure
- Safety protection, operation documentation and factory test record

Note: specifications may be customized according to chamber volume, power supply, fixture layout, and applicable laboratory procedure.

Testing Principle

The chamber accelerates material aging by exposing specimens to intense ultraviolet and visible light from carbon arc lamps while controlling temperature, humidity and periodic water spray. The combined stress can reveal photochemical degradation, fading, yellowing, cracking, surface chalking and mechanical-property loss in a shorter time than natural outdoor exposure.

1. **Carbon Arc Light** — UV / visible radiation
2. **Controlled Heat** — Black panel temperature
3. **Humidity + Spray** — Rainfall cycle simulation
4. **Specimen Exposure** — Uniform aging stress
5. **Performance Evaluation** — Color, cracking, strength

Laboratory operation view: touchscreen interface supports setup and monitoring of the weathering test cycle.

Control and Safety Design

PLC touchscreen operation, closed-loop automatic control, electric control gate for air intake/exhaust balancing, UV protection viewing window and power failure memory support stable day-to-day laboratory operation.

Evaluated Aging Indicators

Color change, fading, yellowing, cracking, embrittlement, loss of tensile strength, coating chalking, adhesion loss and surface durability after accelerated exposure.

Recommended Test Workflow

1. Confirm material and test standard
Define sample type, exposure purpose, target temperature, humidity and spray cycle.

2. Prepare specimens and chamber
Install samples uniformly; verify water, pressure, carbon rods and sensors.

3. Run programmed exposure
Operate the selected dry/rain/heavy-rain cycle and record critical parameters.

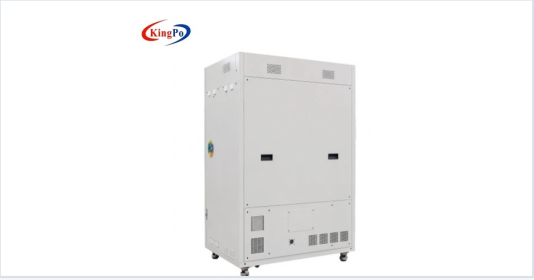
4. Evaluate aging results
Compare pre/post-test appearance, color, mechanical properties, cracking or coating degradation.

Applications and Use Cases

Material / Industry	Typical Evaluation Purpose
Plastics and engineering polymers	Color change, cracking, embrittlement and mechanical degradation after light and moisture exposure.
Rubber and elastomers	Aging resistance of seals, gaskets and flexible materials under heat, humidity and UV-rich radiation.
Coatings, paints and surface finishes	Fading, chalking, adhesion loss and surface durability after accelerated weathering cycles.
Textiles and fabrics	Light fastness, color stability and physical performance after prolonged exposure.
Automotive and outdoor components	Pre-compliance screening for interior/exterior materials exposed to sunlight, heat and rain.
R&D; and quality control laboratories	Comparative material screening and long-term durability prediction in controlled laboratory conditions.

Accuracy and Repeatability Checklist

- Replace carbon rods according to the selected test cycle to maintain light output stability.
- Clean chamber surfaces, specimen holders and spray nozzles regularly.
- Verify calibration of the black panel thermometer, humidity sensor and related measuring channels.
- Maintain appropriate water quality, commonly pH 6.0-8.0, and stable spray pressure.
- Avoid overloading the specimen rack so light and spray exposure remain uniform.
- Record carbon rod use, cycle settings and maintenance actions for traceability.



Rear service view for chamber structure and maintenance access.

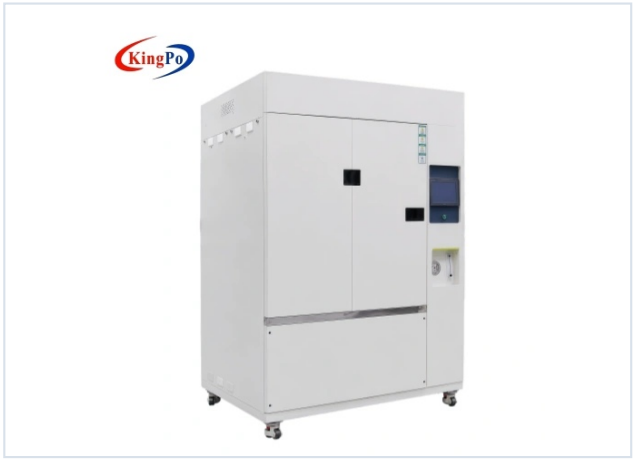
Why Choose KingPo

- Engineering support for test setup and spray-cycle configuration
- Environmental test chamber manufacturing capability
- Custom fixture, chamber size and power options available on request

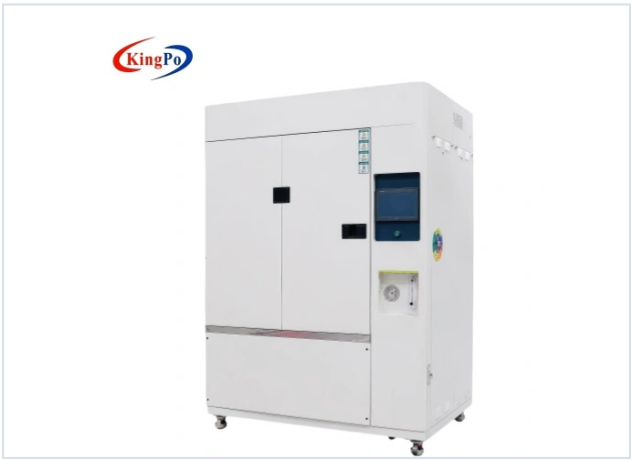
For quotation: provide material type, applicable standard, chamber size, temperature/humidity requirements, spray cycle and power supply.

Product Gallery

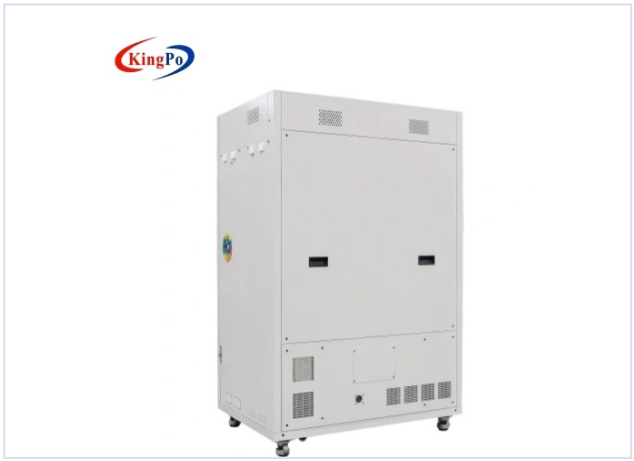
Laboratory operation view



Overall front view



Front view with touchscreen panel



Rear service view

Inquiry Checklist

Please confirm: applicable standard, sample material and dimensions, expected chamber volume, test temperature, black panel temperature, humidity setpoint, spray/rainfall cycle, power supply, installation space, documentation requirements and required delivery schedule.

KingPo Technology Development Limited

Website: www.dgkingpo.com
Product: /product/carbon-arc-test-chamber/
Tel: 86-769-81627526
Factory: Songshan Lake, Dongguan, China

This catalog is prepared from the provided product images and KingPo product webpage content. Technical configuration should be confirmed with KingPo before ordering.