



XENON ACCELERATED WEATHERING TEST CHAMBER - TORONXTC™-400L

Xenon Accelerated Weathering Test Chamber - ToronXTC™-400L is a cutting-edge testing device designed to simulate the effects of sunlight, temperature, and humidity on materials. Utilizing a high-powered xenon lamp, it provides full-spectrum sunlight exposure, mimicking outdoor weathering conditions in a controlled environment. This chamber is ideal for testing the durability, aging, and weather resistance of various materials, such as paints, plastics, and coatings, by accelerating their natural aging process.

APPLICATIONS

Standards

1. **ASTM G151**: Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices That Use Laboratory Light Sources
2. **ASTM D6695**: Standard Practice for Xenon-Arc Exposure of Paints and Related Coatings
3. **ASTM G155**: Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
4. **ISO 11341**: Paints and Varnishes - Artificial Weathering and Exposure to Artificial Radiation - Exposure to Filtered Xenon-Arc Radiation
5. **ISO 105-B02, ISO 105-B04, ISO 105-B06-1**: Textiles - Tests for Color Fastness to Light and Weathering
6. **ISO 3917**: Paints and Varnishes - Resistance to Artificial Weathering
7. **ISO 4892-1, ISO 4892-2**: Plastics - Methods of Exposure to Laboratory Light Sources
8. **ISO 12040**: Graphic Technology - Prints and Printing Inks - Requirements for Lightfastness
9. **EN 50483-6**: Test Methods for Weather Resistance of Electrical Accessories

Simulated sunlight

In the natural climate, solar radiation is the primary cause of coating aging, and the principle of exposure radiation under window glass is similar. The xenon lamp provides the most realistic representation of full-spectrum sunlight, including ultraviolet (UV), visible, and infrared light. Full-spectrum exposure is essential for accurate simulations, particularly in color change and sun fastness testing.

What sets the xenon lamp weathering test chamber apart from other domestic brands is its ability to control and automatically adjust radiation energy throughout the entire test. The energy of the test process plays a crucial role in the aging of polymer materials. To ensure the reproducibility and comparability of test results, controlling radiant energy is a key technical factor. Using a principle similar to the sun's eye, the system continuously monitors the energy value during the test. If the lamp's radiation energy falls short of the set value, the system can automatically replenish it to maintain accurate testing conditions.

Simulated Humid Condensation Environment

In many outdoor environments, materials are often degraded by rain or other moisture. Water spray effectively simulates these environmental conditions during the testing process. It plays a crucial role in replicating thermal shock or mechanical erosion caused by sudden temperature changes and rain washout. For example, under certain conditions such as sunlight, when accumulated heat is rapidly dissipated by a sudden shower, the temperature of the material can drop sharply, leading to thermal shock. This is a significant test for many materials.

The water spray system is designed with two nozzles, one on each side at the top of the test chamber. The system can operate for a few minutes and then shut off. This short-duration spray rapidly cools the sample, creating conditions for thermal shock. The spray can also be configured to follow either a dark or light cycle.

Note: The water used in the test process must be purified.

Performance Characteristics

1. **Xenon Light Source:** The light source complies with international standards, providing a more realistic and optimal simulation of full-spectrum sunlight. A stable light source ensures the comparability and reproducibility of test data.
2. **Unique Reflective System:** The innovative reflective system design ensures a more uniform distribution of radiation energy within the chamber.
3. **Automatic Irradiation Energy Control:** The system uses a closed-loop control system to automatically adjust and compensate for changes in irradiation energy caused by lamp aging or other factors, ensuring precise and stable control across a wide range.
4. **Customizable Irradiation Energy Control Points:** Users can select and set the irradiation energy control points on the operation interface, in full compliance with ISO standards (340nm, 420nm, or 300-400nm). Parameters can be set according to various industry standards for convenience.
5. **Xenon Lamp:** The system utilizes high-energy xenon lamps with a lifespan of up to 2000 hours.
6. **Optical Filters:** A variety of optical filters are available to meet both domestic and international testing standards.
7. **Spray Function:** The spray function allows for customizable spray time and intervals.
8. **Customizable Test Programs:** The test chamber supports multiple test programs, with up to 6 user preset programs, each capable of storing 10 segments of data.
9. **Real-Time Data Collection and Storage:** Test data is automatically recorded in EXCEL format and saved, with the option to export via USB for unattended operation.
10. **Touchscreen Interface:** The touchscreen menu is user-friendly and allows operators to easily set test parameters and monitor the test process.
11. **High-Precision Temperature Control:** A high-precision Pt100 blackboard temperature sensor ensures automatic control of the blackboard temperature, with a range from room temperature +30°C to 90°C.
12. **Slide-Out Tray:** A unique slide-out tray makes sample installation and evaluation quick and easy.
13. **Accelerated Aging Results:** The test chamber provides continuous exposure to summer noon sunlight 24 hours a day, accelerating aging and allowing samples to undergo rapid testing, mimicking years of outdoor exposure.

FEATURES

- **USB Interface for Real-Time Data Collection:** The experimental data is automatically generated and recorded in Excel format and exported through a USB disk, allowing for unattended operation via a touch screen menu.
- **User-Friendly Touch Screen Control:** The touch screen interface is convenient, allowing operators to set test parameters and monitor the entire experiment process in real time.
- **High-Precision Temperature Monitoring:** Equipped with a Pt100 blackboard temperature sensor and a black mark thermometer, the chamber can monitor the temperature of the blackboard and black mark areas in the sample room.
- **Three Independent Xenon Lamps (1.8KW Each):** The xenon lamps ensure the light source provides a strong radiation intensity, with easy replacement of the lamp tubes in a door light box room.
- **Adjustable Top Lamp Design:** The lamp-to-sample distance is adjustable from 400mm to 800mm, and the stainless steel tray allows for arbitrary placement of the sample.
- **Automated Temperature and Humidity Control:** The working room temperature is automatically controlled within a range of 30%–75% when illuminated and 50%–95% during spray or dark cycles.
- **Simulating Sunlight and Rain Effects:** The xenon lamp simulates the full spectrum of sunlight, and the water sprinkler system can simulate the effects of rain. Irradiation energy and temperature are controllable throughout the test cycle.
- **Typical Test Cycles:** The chamber performs xenon illumination at high temperatures, followed by periodic rain, to simulate real environmental conditions for material aging, including fading, light loss, reduced strength, cracking, spalling, chalking, and oxidation.
- **Applications:** This aging test chamber is typically used for testing paints, automotive materials, plastics, wood products, adhesives, and other materials affected by sunlight and rain.

TECHNICAL SPECIFICATIONS

Specification	Details
Internal Size (W*H*D)	700 x 850 x 700 mm

Specification	Details
External Size (W*H*D)	1200 x 2050 x 1550 mm
Number of Sample Racks	2 (samples can be placed arbitrarily)
Blackboard Thermometer	Insulation type black standard thermometer + blackboard thermometer
Blackboard Temperature Range	Room temperature +30°C ~ 90°C
Testing Temperature Range	-35°C ~ 110°C
Temperature Fluctuation	Within $\pm 3^{\circ}\text{C}$
Chamber Humidity Range	30% ~ 75% (lighting), 50% ~ 95% (spray or dark cycle)
Irradiance can be set	0.3 to 1.0 W/m ² (@ 340 nm) 0.50 to 1.8 W/m ² (@ 420 nm) 30 to 120 W/m ² (@ 300 to 400 nm)
Xenon Lamp Power	3×1.8 KW air-cooled xenon lamp
Rated Power of the Whole Machine	4 KW (maximum instantaneous power can reach 6KW)
Lamp Life	Normal use for more than 2000 hours
Pure Water Flow	Humidification 0.2 L/min, sample spray 0.3 L/min
Filter	Optional Extended UV filter, daylight filter, window glass filter
Humidification Method	Ultrasonic humidifier controls humidification
Internal Chamber Material	SUS#304 stainless steel
External Chamber Material	Cold rolled sheet with powder coating treatment
Votlage	Three-phase 380V, 50HZ, 32A



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