

High-irradiance Xenon Test Chamber

During service life, weathering evaluation of coatings and polymer materials constitutes an indispensable key step for formulation development, product finalization and quality control. Conventional laboratory light sources, namely xenon arc weathering testers, can typically simulate only around $1\times$ solar irradiance at noon. A full weathering test often takes thousands of hours, resulting in lengthy R&D iteration cycles that fail to meet the needs of coating enterprises for rapid new material screening, formulation comparison and failure mechanism investigation.

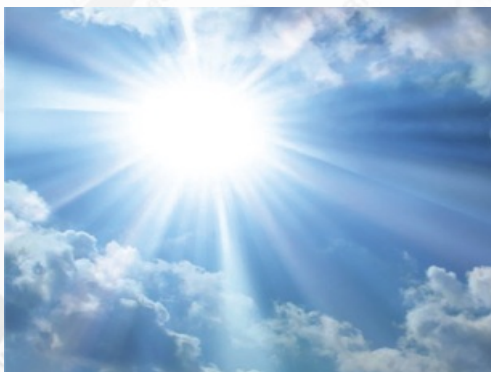
The latest ISO 16474-2 and ISO 4892-2 both recommend a commonly used irradiance of $0.51\text{ W}/(\text{m}^2\cdot\text{nm})$ for exposure with daylight filters. Meanwhile, the standards specify that high-irradiance xenon arc equipment can deliver irradiance at 3 to 4 times this level. High-irradiance testing has been proven effective for several types of materials, automotive interior materials for instance.

When running high-irradiance tests, the linear relationship between material properties and irradiance must be carefully examined. Results obtained under different irradiance levels can only be compared when other test parameters (black standard/black panel temperature, chamber air temperature and relative humidity) remain comparable.

To address this market demand, Biuged has independently developed a high-irradiance xenon arc weathering tester. Breaking the irradiance limit of conventional xenon arc weathering testers available on the market, this equipment achieves $2\text{--}4\times$ solar irradiance. While maintaining a spectrum matching natural sunlight, it drastically shortens the photoaging test cycle and delivers an efficient accelerated weathering test solution for coatings, plastics, composites and other materials.

Typical Application Scenarios of High-Irradiance Testing

- ◆ **Material R&D laboratories:** Rapid parallel screening of multiple formulations; fast evaluation of weathering resistance for light stabilizers, resins and pigments to shorten R&D cycles.
- ◆ **Incoming raw material assessment:** Rapid evaluation of photoaging resistance of resins, fillers, additives, raw materials and finished products.
- ◆ **Failure analysis:** Accelerated recreation of outdoor ageing defects; research on coupled ageing mechanisms of material photo-degradation and oxygen diffusion.
- ◆ **Pre-screening tests:** Early-stage elimination of non-weatherable formulations in new material development, reducing investment in long-duration conventional ageing tests.



Xenon lamp simulates 2 to 4 times of solar irradiance intensity



Simulated Rainfall



One-stop
PURCHASE
Perfect price-performance ratio products
Professional
SERVICE

Main Features

Advanced Technology & Powerful Functions

- ◆ Delivers high irradiance of 2~4 times solar intensity to rapidly accelerate material ageing.
- ◆ Each specimen rack is equipped with an independent timing function, enabling operators to quickly identify panels subjected to different exposure durations.
- ◆ Latest resonant circuit technology for faster and more reliable lamp ignition;
- ◆ Real-time monitoring of cooling water flow for the lamp, ensuring stable and reliable cooling;
- ◆ The lamp control circuit now includes both voltage and current loops in addition to the original closed-loop irradiance control system, delivering more stable irradiance regulation.
- ◆ Meet with all international standards of xenon test.
- ◆ Equipped with ATLAS xenon arc lamp, filter and components, ensure to get high and same running parameters. Test results have a good reliability and repeatability comparing with import machines.
- ◆ Automatic rotating drum-type sample rack with three floors structure maximizes exposure uniformity over all specimens
- ◆ Can set the cumulative energy (total irradiance energy) obtained by sample to finish a test procedure.
- ◆ Advanced cooling system for xenon lamp and intelligent air system.
- ◆ Chinese or English operation window

Simple, easy to use

- ◆ Adopts integrated industrial touchscreen PC for menu-based operation and control. Featuring a user-friendly interface, it allows operators to freely set test parameters and monitor real-time status of all parameters during the test.
- ◆ Preloaded with six commonly used standard test programs for direct recall and use.
- ◆ Users can also customize and save test programs as required. Over 9999 editable programs are supported, and each program can be configured with up to 30 different working segments with sub-cycle functions.
- ◆ Equipped with a USB port. Users can export all test operating parameters from the instrument at any time; the system automatically generates Excel spreadsheets for checking equipment operating status at any time point.
- ◆ Supports remote monitoring of all operating conditions of the xenon arc main unit to facilitate data management.
- ◆ Comes with a mobile APP, enabling users to monitor equipment operation anytime.

Direct Setting and Automatic Control of Multiple Test Parameters

- ◆ Direct setting and automatic control of irradiation energy (340 nm, 420 nm, 300 nm~400 nm, 300 nm~800 nm) with a wide controllable range. The system automatically monitors and compensates irradiation energy deviations caused by lamp ageing and other factors.
- ◆ Direct setting and automatic control of chamber temperature, black panel temperature (BPT) and black standard temperature (BST), equipped with high-precision Pt100 temperature sensors.
- ◆ Direct setting and automatic control of chamber humidity. The spray humidification system delivers more uniform and stable humidity.
- ◆ Direct setting of specimen spray modes (front-side spray or back-side spray), spray duration and spray interval.

Safe, Reliable and Easy to Maintain

Multiple Alarm Protection Functions

- ◆ In case of excessive irradiance error, excessive pure water conductivity, high cooling water temperature, low cooling water tank level, low cooling water flow, over-temperature or abnormal lamp power, the instrument will shut down automatically and display corresponding alarm information on the operation interface.
- ◆ Standard equipped with a pure water system to meet the water consumption requirements of the instrument.
- ◆ Customizable special specimen rack dimensions, clamping methods and others according to users' actual requirements.
- ◆ 24/7 online professional support and regular on-site maintenance service.



SAE J2527 Accelerated Exposure of Automotive Exterior Materials Using a Controlled Irradiance Xenon-Arc Apparatus



Ordering Information → Technical Item ↓	BGD 862 Pro High-irradiance Xenon Test Chamber	BGD 862 Pro+ High-irradiance Xenon Test Chamber
Xenon Lamp	6.5 kW water cooling long arc xenon lamp	
Light Filter	Import originally from ATLAS, can simulate indoor or outdoor sunshine spectrum	
Exposure Area	45 pcs standard samples of 15cm × 7cm size	28 pcs standard samples of 15cm × 7cm size
Monitoring Method to Irradiance	Four types: 340nm, 420nm, 300nm ~ 400nm, 300nm ~ 800nm Showing at the same time	
Adjustable Irradiance	45W/m ² ~ 224W/m ² (300nm ~ 400nm) or 0.4 W/m ² ~ 2.0 W/m ² (@ 340nm) or 0.88 W/m ² ~ 4.4 W/m ² (@ 420nm)	78W/m ² ~ 336W/m ² (300nm ~ 400nm) or 0.7W/m ² ~ 3.0 W/m ² (@ 340nm) or 1.54 W/m ² ~ 6.6 W/m ² (@ 420nm)
Lifetime of lamps	2,000 hours	
Adjustable Range of BPT	RT~110℃	
Adjustable Range of BST	RT~120℃	
Adjustable Range of Working room	RT~70℃ (Dark)	
Temperature stability	±1℃	
Temperature uniformity	≤2℃	
Temperature Deviation	≤1℃	
Adjustable Humidity	Light: 10%~75% Dark: 10%~95%	
Rotate speed of sample	1r/min (circle as lamp centre)	
Spray Function	Can set spray continuous time and spray period	
Water demands	High purity deionized water (Conductivity<2us/cm)	
Compressed Air	Clean, oilless compressed air with 0.5MPa pressure, Max. air supply is near 60L/min. Average air consumption is 10L/min ~ 30L/min (Depends on testing standard)	
Flow of Deionized Water	0.2L/min (Add humidity or spray)	
Power Supply	AC380V ± 10%, Three-phase four-wire 50Hz; Max. Current 50A, Max. Power 9.5KW	
Overall Size	1,220mm × 1,200mm × 1,970mm (L × W × H)	
Net Weight	500 kg	
Structure		
Cabinet Material	Working room is made up of good quality stainless steel (SUS 316)	
Chamber Door	Simple door to left with filter window; silicon rubber seal the door edge	
Sample Holder	Stainless steel material, its position in the chamber can be adjusted (up, middle or down) , Sample crack rotate around the centre of lamp	
Controller	Siemens programmable controller. LCD touch-screen	
Way of adding humidity	Add humidity by high pressure aerosol	
Thermometer	Heat insulate type black standard thermometer and black board thermometer	
Cooling System	Cooled by compressor and forced-air blast system	
Security Protections And Error Protections		
Xenon Lamp Protect	Over temperature of cooling water, low flow of cooling water, abnormal of lamp power	
Alarm Function	Big irradiance difference, over-temperature of BPT or BST or Working room, big error of humidity, spraying water shortage, pure water conductivity is over limits. Operator can set these values and downtime	
Cooling Water System Protect	Monitor the conductivity of cooling water at real-time	
Protection to Radiation	Xenon lamp will turn off automatically when opening the chamber door, in case xenon lamp radiate operator	
Installing Environment Requirements		
Site Requirement	Net area of installation site ≥12m ² ; Net height ≥2.8m. Equipped with separate air condition which can ensure a 22℃ ~ 30℃ & 30% ~ 80% environment permanently. No strong electromagnetic fields, no high concentration dust, no corrosive gas or flammable materials.	
Power Source	380V±10% 3-phases; 50Hz; 50A power source; Equipped with circuit, ground wire and air circuit breaker.	
Air Outlet	There should be air outlet (Distance to chamber ≤1.0m, height to ground is 2.5m ~ 2.7m, diameter should be 153mm)	
Water Supply	Equipped with water supply pipes and valves, Supply water pressure≥2.0kg/cm ² ; conductivity≤120us/cm	
Drainage	Draining pipes diameter≥50mm, height to ground≤10cm, distance to chamber≤0.5m	