

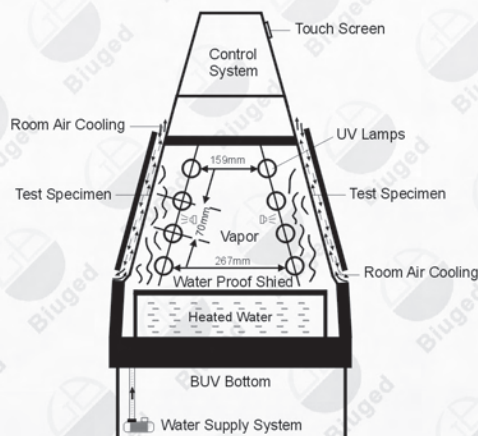
## UV Light Accelerated Weathering Tester

**B**GD 855 & 856 UV Light Accelerated Aging Test Chamber (hereinafter referred as BUV) adopts fluorescent UV lamp as the light source. Its inner temperature and humidity can be properly controlled to obtain the periodic condensation on the sample for fully evaluating the damaged factor caused by sunlight, moisture and temperature (materials aging phenomenon includes fading, disluster, intensity reduction, cracking, flaking, chalking, and oxidation).

Fluorescent UV light can emulate the effect of sunshine, while condensation and water spray system can emulate the effects of rain and dew. During the test, radiation energy and temperature are controllable. A typical test cycle generally carries out under strong irradiation of UV light or in the dark and wet condensation period with 100% relative humidity. These tests generally applied in the fields of paint and coatings, automotive industry, plastic, wood, glue, etc

### Test Methods & Material Standards

- ◆ ISO 11507 《Paints and varnished-Exposure of coatings to artificial weathering- Exposure to fluorescent UV lamps and water》
- ◆ ISO 4892-1 《Plastics-Methods of exposure to laboratory light sources-Part 1: General Guidance》
- ◆ ISO 4892-3 《Methods of exposure to laboratory light sources-Part 3: Fluorescent UV lamps》
- ◆ ASTM D 4587 《Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings》
- ◆ ASTM D 4329 《Standard Practice S for Fluorescent UV Exposure of Plastic》
- ◆ ASTM G-151 《Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that use laboratory light sources》
- ◆ ASTM G-154 《Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Non-Metallic Materials》
- ◆ BS 2782:Part5, 《Method 540B (Methods of Exposure to Lab Light Sources) 》
- ◆ SAE J2020 《Accelerated Exposure of Automotive Exterior Malts Using a Fluorescent UV/Condensation Apparatus》
- ◆ JIS D 0205 《Test Method of Weather-ability for Automotive Parts》



BUV Test principle

#### Main Technical Parameters:

- ★ Light Source: UV-A (wave length 340 nm) or UV-B (wave length 313 nm) ; 40W × 8 pcs (The normal use-life is 6,000 hours)
- ★ The range of Irradiance: 0.1 W/m<sup>2</sup> ~ 1.0 W/m<sup>2</sup>
- ★ Temperature Range: Black Panel temperature ( BPT ) : RT+10°C ~ 80°C
- ★ Interior of cabinet: Stainless steel –SUS 304 material
- ★ Exterior of cabinet: Powder coating on SUS 304
- ★ Insulating Area: 5,175cm<sup>2</sup>/828in<sup>2</sup>
- ★ Sample Capacity: 48 pieces of standard specimen ( 75 × 150mm standard samples ) or 15 pieces of 100 × 300mm
- ★ Adjustable range for water supply: 0–4LPM
- ★ Water Consumption: 7L/day ( for condensation ) ; 4L/minute ( for spray )
- ★ Overall Size: 1,360 × 520 × 1,310mm ( L × W × H )
- ★ Net weight: 165 kg                      Total Max. Power: 3KW
- ★ Power: 220VAC ± 10%    50/60Hz; 15A ( Max Electric Current )

#### Feature

◆ **Original UVA or UVB lamps from American, ensure the comparability of testing results.**

All UV machines use fluorescent UV lamps produced by American as testing light source, comparing with other type lamps (including Xenon Lamps), UV lamps are more stable. Its spectrum power distribution won't change as the lamps weathering, even to 6,000 hours. Thus more repeatable testing results can be achieved easily, and decrease changing lamps times and reduce the running cost.

Furthermore, these lamps from American are produced on the base of more than 40 years' experience and fluorescent technology. It is designed specially and tested with most serious quality control.

◆ **With Original Intellectual Property Rights and Initiated in China, our ballast can extend the lamp life to 6,000 hours, save use-cost greatly for users.**



Original UV lamps from America



Four sensors monitor UV irradiance

◆ **Irradiance can be controlled automatically (with the closed-loop system, the value of irradiance is more precise and steady. Only for BGD 856)**

The superiority of BGD 856 UV Light Accelerated Aging Test Chamber is that it can be controlled and adjusted automatically during testing process. As it is well known, the energy in testing process is the main factor in polymer materials aging. In order to ensure reproducibility and comparability of testing results, the UV energy is a very important technical indicator. We adopt the principles which similar with Sun-eye automatically monitor the testing process throughout the energy value, when the lamp energy is less than the expected value, the system can automatically monitor the difference and automatically replenish energy immediately.

◆ **Irradiance can be calibrated automatically (Only for BGD 856)**

As any other lamps, UV lamps energy of UV also decreases as time increase. The control system would compensate it automatically through strengthening the voltage of lamps. But as the using time become longer and longer, the energy of lamps



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decrease continuously. For some high set point of irradiance, UV couldn't keep this irradiance any longer, and now the system of UV would reminder failure the error of irradiance is too large and shut off the machine. Now, the operator should calibrate the UV by standard calibration radiometer. If machine still can't get the set point after calibrating, the user should replace the two pcs lamps corresponding to the relative sensor and calibrate again.

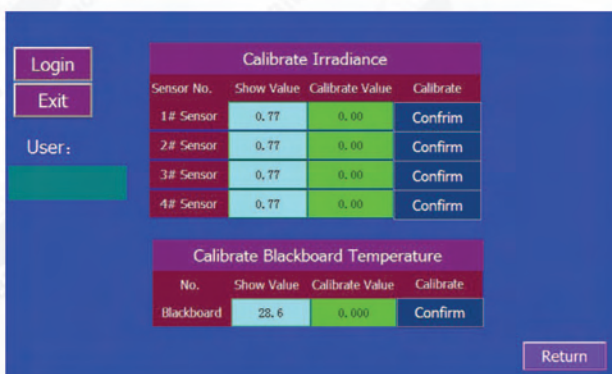
UV is calibrated by BGD Calibration Radiometer which is produced by our company. User can use one radiometer to calibrate some UV, radiometer can test fluorescent UV lamps. It is not only used to calibrate the UVA lamps, but also to do UVB lamps. For UVB lamps, it has been calibrated well under the wave length 313 nm with W/m<sup>2</sup>/nm unit before delivery. For UVA lamps, it has been calibrated well under the wave length 340 nm with W/m<sup>2</sup>/nm unit.

Calibration Radiometer is made up of radiometer and sensor (see picture as below) :

The sensor of BGD 8118 calibration radiometer is very sensitive to ultraviolet rays, but don't have any action to visible light, and just have a little response for infrared light even can be ignored. So other rays can't bring any influence for this radiometer.



Calibration Radiometer



UV Calibration Windows

The sensor of BGD 8118 calibration radiometer is very sensitive to ultraviolet rays, but don't have any action to visible light, and just have a little response for infrared light even can be ignored. So other rays can't bring any influence for this radiometer.

◆ **Water Spray and Condensation function**

**Water spray**

For some applications, the water spray can simulate end-use environmental conditions better. Water spray can effectively simulate heat shock or mechanical erosion caused by dramatic temperature changes or rain. In some practical application conditions, such as a sudden brash in a sunshine day, can bring heat shock because the temperature of the material changes drastically. This heat shock severely tests the properties of many materials. UV water spray can simulate this heat shock and / or stress corrosion.

UV spray system design with 12 nozzles, each side has 6 pieces in the test chamber. Spray system can run a few minutes and then shut down. This transitory water spray can cool the samples quickly, creating heat shock conditions.

**Condensation**

In many outdoor environments, materials are placed in wet condition for over 12 hours each day. Studies have shown that the main factor of this wet condition outdoor is caused by dew, not rain. UV simulates the outdoor moisture erosion through the unique condensation capabilities. In the condensation cycle during the test, water on the bottom of the chamber is heated to obtain superheated steam filling the test chamber. Hot steam makes the chamber maintain 100% relative humidity, and maintain a relatively high temperature. Sample was fixed on the wall of test chamber. Thus the sample surface is exposed to the ambient air of test chamber. The other side of the sample is exposed to the natural environment which has a cooling effect, bringing internal and external surfaces of the sample with temperature difference, and the temperature difference leads to the test surfaces always have drips caused by condensation process.

**Browse Data**

Time	Sensor 1#	Sensor 2#	Sensor 3#	Sensor 4#	Blackboard Tem.	Water Tem.
2011-10-09 11:53:06	0	0	0	0	0	0
2011-10-09 11:51:00	0	0	0	0	0	0
2011-10-09 11:50:00	0	0	0	0	0	0
2011-10-09 11:49:00	0	0	0	0	0	0

Count

Start Time

Finish Time

BUV Import Data Windows

MCGS_Time	Sensor 1#	Sensor 2#	Sensor 3#	Sensor 4#	Blackboard Tem.	Water Tem.
2011-7-8 12:04	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:05	0.77	0.77	0.77	0.77	59.9	32.4
2011-7-8 12:06	0.77	0.77	0.77	0.77	59.9	32.4

Format of Import Data



◆ **Ordering Information:**

- [BGD 855 : Basic BUV--- Basic UV Light Accelerated Weathering Tester \( No irradiancance control \)](#)
- [BGD 856 : BUV---UV Light Accelerated Weathering Tester](#)
- [BGD 8110 : UVB lamps \(40w/313nm\)](#)
- [BGD 8111 : UVA lamps \(40W/340nm\)](#)
- [BGD 8118 : Calibration Radiometer \(310nm&340nm\)](#)
- [BGD 8120 : 0°C Standard Resistor](#)
- [BGD 8121 : 100°C Standard Resistor](#)
- [BGD 8130 : Sample Shelf](#)