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ARTIFICIAL ACCELERATED AGING TEST CHAMBER

THE EXPERT OF AGING TEST INSTRUMENT AROUND YOU



BIUGED INSTRUMENTS CO.,LTD

— Since 1963 —

ABOUT US

Biuged Instruments has been focusing on developing and innovating high-quality and high-precision instruments for polymer materials such as plastics, coatings and adhesives for 50 years. Through advanced science and technology, Biuged continuously performs research and development to improve product performance which ensures quality products for our clients.

Biuged is one of the largest manufacturers of testing instruments for polymer materials, and we are also the earliest company specializing in the research and development of light aging (artificial accelerated aging) test equipment in China. At present, we have more than 150 employees, including more than 60 with bachelor degrees or above and more than 40 technical engineers. Moreover, Biuged has more than 40 sales agents all over the world. We are the only manufacturer of testing instruments for polymer materials in China whose products all have been certified conform the European CE standards.

Biuged has own independent R&D team and a third-party calibration laboratory approved by CNAS. In order to improve the durability and usability of products, as well as the reproducibility and comparability of test results, we keep the maximum investment in research and development. As a main member of the Technical Committee for Standardization of Coatings and Paints (TC5), Biuged is involved in draft and revision work of Chinese governmental standards, and we have drafted over 50 national standards related with testing methods.

Biuged always adheres to the innovative spirit of "Professional, Precise", and strives for the goal of "More Accurate, More Efficient". "Quality First, Customer First" guides us forward. With our professional and dedicated team, rich precision machining and automation technology, Biuged sincerely looks forward to working with you by offering the best products and services.



Headquarters



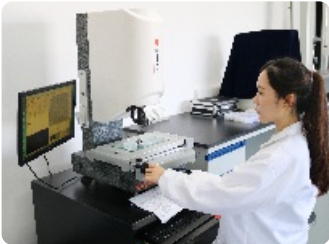
Factory



Workshop



QC Laboratory



Calibration Laboratory with CNAS Certification



R&D Department



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Artificial Accelerated Aging Test

Artificial accelerated aging test is a part of material reliability test. It simulates the aging process of materials caused by practical application and accelerates the aging process. Generally speaking, the artificial accelerated aging test is to put the material into the aging chamber for a period of time, and then observe the changes.

Purpose of artificial accelerated aging test

1. Evaluate whether the product quality meets relevant technical standards during R&D and quality inspection.
2. Rank the weather resistance performance, or establish correlation with outdoor natural aging.
3. It is difficult to get a large number of outdoor aging test data, so this test can predict the weather resistance of products and avoid the loss caused by aging.
4. Selection of similar products.
5. Improve the competitiveness of products and enter the high-end market.

Significance of artificial accelerated aging test

As the natural aging test should take several years to determine the aging result. The time cost is too high for ordinary enterprises. Especially in this competitive era, the product development cycle is very short. If the test cycle of a new product takes several years, then the product is not competitive at all.

On the other hand, due to the different climatic conditions in different places, the same test materials may get very different aging results. The repeatability and reproducibility of test results are not good. Therefore, users tend to use artificial accelerated weathering tester, which can not only shorten the test period, but also has good repeatability. It can be used for quality control, material stability test and rapid comparison screening test of materials. In addition, artificial accelerated aging test is widely used. Because the instrument is used indoors, which will not be limited by natural conditions. Only human factors are considered. It is convenient to use and has high controllability.

How long is the artificial accelerated aging test equivalent to one year in the natural environment?

This question is very common and difficult to answer, even for knowledgeable and experienced researchers in the field of aging. At present, there is no standard or paper clearly indicating how long the accelerated aging of laboratory is

equivalent to one year in the natural environment, and no clear formula is given. The main reason is that there are too many factors that change the natural conditions, resulting in product aging, such as light intensity, illumination time, temperature, humidity, rainfall, pollutants and so on. The lab can't simulate all of them.

The durability of outdoor materials (exposed to sunlight outdoors) is mainly related to the following factors:

1. Altitude(Higher altitude means stronger ultraviolet rays.)
2. Geographical latitude(The closer to the equator, the ultraviolet rays are more stronger.)
3. Local environment, such as wind speed will affect the air-drying degree of samples or promote condensation near water.



5. Insulation performance of samples(Outdoor material placed on insulation carrier ages 50% faster than which placed on non-insulation carrier.)

When the material is subjected to artificial accelerated aging test:

1. Irradiance energy of test chamber
2. Spectrum distribution of light source used in the test chamber
3. Test cycle of test chamber (irradiance time and humidity time)
4. Operating temperature of the test chamber (The higher temperature is, the aging becomes faster.)

Therefore, it is no meaningful to logically discuss about the conversion factor between artificial accelerated aging time and outdoor exposure time. Because one is in a constant environment, while the other is in a changing state. Finding the conversion factor between them is beyond the scope of change. In other words, weather data is relative. However, you can still get excellent aging test data from artificial accelerated aging test. But you should realize that the data is relative, not absolute. Compared with other materials, the reliable data in this test is the relative aging grade of the tested materials.



Simulated Sun with full spectrum



Simulated Rainfall

How to choose the suitable Accelerated Aging Test Chambers? UV Light Accelerated Aging Chamber or Xenon Test Chamber?

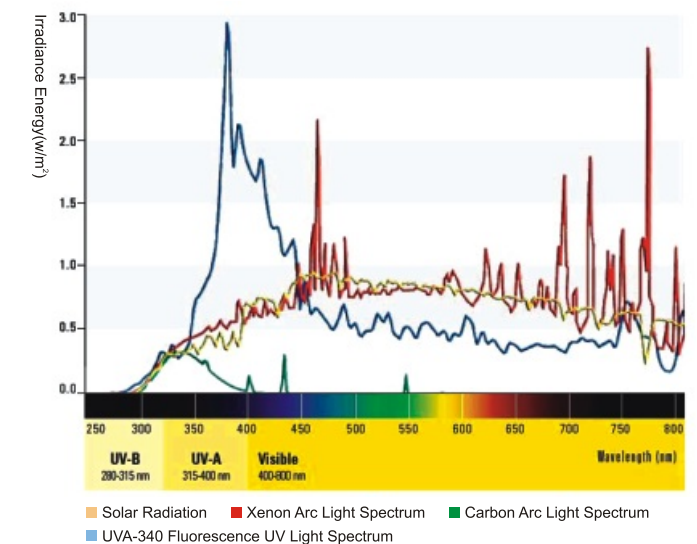
UV Light Accelerated Aging Test

- ◆ Short test time, and the unique condensation system(100%RH), it can effectively simulate the erosion of wet condition outdoor.
- ◆ Compared with Xenon test, the cost is greatly saved.
- ◆ Stable spectrum can ensure the reproducibility and comparability of testing results.

Xenon Light Accelerated Aging Test

- ◆ Xenon lamp can emulate the full spectrum sunlight, including ultraviolet rays, visible light and infrared rays. Especially suitable for various testing of dye, pigment, textile, printing ink and outdoor materials, etc. The test results have a great correlation with the actual application of outdoor materials.
- ◆ The authenticity of spraying is not as good as that of condensation cycle of UV lamp.
- ◆ High operating cost.

Wavelength Distribution of Common Light Sources in Laboratory



Xenon Light Accelerated Aging Test Chambers

Test Principle

Artificial weathering of coatings or exposure of coatings to filtered xenon-arc radiation is carried out in order to obtain the degree of change in a selected property after a certain radiant exposure H, and/or the radiant exposure which is required to produce a certain degree of ageing. The properties selected for monitoring should preferably be those which are important for the practical use of the coatings. The properties of the coatings exposed are compared with those of unexposed coating prepared from the same coating materials at the same time and in the same way (control specimens) or with those of coatings exposed at the same time whose behavior during testing in exposure apparatus is already known (reference specimens).

Xenon lamp is full of xenon, and would send out light because of xenon discharge. The energy distribution of spectrum through this way is very close to sunshine, and its color temperature is near 6,000K. Furthermore, xenon lamp has a stable character, its spectrum energy distribution wouldn't change at all within the limited lifetime, this is because its spectrum distribution among continuous spectrum part don't have any relation to input power of lamp. As a special light source, xenon lamp has a good consistency for electric parameters, and it is easy to light, once light on, it can output a steady light energy at once. Furthermore, during working, the electric parameter won't be influenced by any external conditions.

Xenon Lamp light can emulate the effect of sunshine, while 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 Xenon light and periodic precipitation. These tests generally applied in the fields of paint and coatings, automotive industry, plastic, wood, glue, etc.

BGD series Xenon Light Accelerated Aging Test Chambers (hereinafter referred as B-SUN) use Xenon lamps as artificial light source, and can modify the full spectrum sun light. Controlling the temperature, humidity. Its inner temperature and humidity can be properly controlled to obtain the periodic precipitation 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).

Based on sample holder type, B-SUNS are divided into flatbed type and rotating drum type.



All B-SUN Types

Ordering Information→ Parameters ↓	BGD 865A Bench Xenon Chamber	BGD 866A Small Xenon Chamber	BGD 860 New Xenon Chamber	BGD 862 Plus Big Xenon Chamber
Xenon Lamps	1 piece 1.8KW air-cooled American xenon lamp		1 pc 1.8KW air-cooled American xenon lamps	1 piece 6.5 KW water-cooled American xenon lamp
Filters	Extended UV filters	Daylight Filters	Daylight Filters	Daylight Filters
Sample holder	Flatbed	Flatbed	Rotating drum	Rotating drum
Samples Capacity (150×70mm)	9 pieces	9 pieces	22 pieces	65 pieces
Edit Program	No	Yes (6 programs)	Yes (10 programs)	Yes (15 programs)
Spray Function	No	Yes (front)	Yes (front & back)	Yes (front & back)
Dark Function	No	Yes	Yes	Yes
Control BPT.	Yes	Yes	Yes	Yes
BPT. Range	RT+20℃ ~ 90℃	RT+20℃ ~ 90℃	Rt ~ 100℃	Rt ~ 110℃
Working room Tem. Range	—	—	RT~65℃	RT~70℃
Control Irradiance	Yes	Yes	Yes	Yes
Irradiance Range (300~400nm)	30 ~ 100W/m ² (American lamp)		30 ~ 90W/m ²	29 ~ 141W/m ²
Monitoring method to irradiance	1	3	4	4
Monitor cumulative Energy	No	Yes	Yes	Yes
Control work room relative humidity	No	Only show	Yes	Yes
Export test data	Yes	Yes	Yes	Yes
Alarm Function	Yes	Yes	Yes	Yes
Calibration Function	Yes	Yes	Yes	Yes
Pure water machine	No	Optional	Optional	Optional

B-SUN Filter

Biuged mainly offers three different filters to meet with different testing requirements.

① **Daylight Filters:** used to simulate noon summer direct sunlight, they can offer the best correlation to the natural exposures for most fact applications. Materials which are typically used outdoors like exterior coatings or outdoor rubbers should be tested using Daylight Filters. This test is called as “**Artificial Weathering Test**”

② **Window Glass Filters:** Using 3mm thickness window glass to produce spectra equivalent to sunlight coming through normal window glass. This spectrum can also simulate some indoor lighting such as the harsh lighting found in a typical commercial or office environment. They are used for indoor materials such as printing materials or textiles. This test is called as “**Exposure to Artificial Radiation Test**”

③ **Extended UV filters:** These filters allow excess UV, below the normal cut-on of natural sunlight, used to simulate sunlight which doesn't come through atmosphere. They are used to produce faster or more severe test results. This test is called as “**Artificial Accelerated Weathering Test**”

Monitoring Method to Irradiance

In the system of xenon test, measuring and controlling irradiance is very important. The spectrum range of xenon lamp is from 295nm to 3,000nm. In the newest standards (such as ISO 11341-2004, ASTM G 155-05, ISO 4892-2: 2003 etc), irradiance is recommended to be measured and controlled by point (narrow band) or broad band.

Narrow band: 340 nm or 420 nm

Broad band: 300-400 nm

Choosing narrow band or broad band depends on different simulated environment or different material.

340 nm narrow band: for outdoor and evaluate physical performance of material

420nm narrow band: for indoor and evaluate fading of material

300nm-400nm (TUV) : for small special standards.

Test Standards

ISO 11341 《Paints and varnishes-Artificial weathering and exposure to artificial radiation--Exposure to filtered xenon-arc radiation》

ISO 12040 《Graphic Technology - Prints and Printing Inks - Assessment of Light Fastness Using Filtered Xenon Arc Light

ISO 16474-1 《Paints and varnishes -- Methods of exposure to laboratory light sources -- Part 1: General guidance》

ISO 16474-2 《Paints and varnishes -- Methods of exposure to laboratory light sources -- Part 2: Xenon-arc lamps》

ASTM D3451 《Standard Guide for Testing Coating Powders and Powder Coatings》

ASTM D3794 《Standard Guide for Testing Coil Coatings》

ASTM D4303 《Standard Test Methods for Lightfastness of Pigments Used in Artists' Paints》

ASTM D5010 《Standard Guide for Testing Printing Inks and Related Materials》

ASTM D6577 《Standard Guide for Testing Industrial Protective Coatings》

ASTM D6695 《Standard Practice for Xenon-Arc Exposures of Paint and Related Coatings》

ASTM G151 《Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources》

ASTM G155 《Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials》

ISO 4892-1 《Plastics Methods of Exposure to Laboratory Light Sources Part 1: General guidance》

ISO 4892-2 《Plastics - Methods of Exposure to Laboratory Light Sources - Part 2: Xenon-arc lamps》

SAE J2412 《Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Xenon-Arc Apparatus》

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



BGD 865/A Bench Xenon Test Chamber



Introduction

BGD 865/A is a small, simple and economic xenon test chamber. It uses a low power air-cooling xenon lamp to produce enough big irradiance energy in a small space. Moreover, through a special catoptrical system to ensure every exposure sample get the homogeneous irradiance distribution.

BGD 865 is equipped with extended UV filters, thus permit UV which is below the normal cut-on of natural sunlight to pass (equal to simulate sunlight which doesn't come through atmosphere). They are used to produce faster or more severe test results. This test is called as “**Artificial Accelerated Weathering Test**”.

Scope of application



Characters

- ◆ Small Size, easy to install, use and practically maintenance-free.
- ◆ The xenon light source correspond with international standards; ensure reproducibility and comparability of testing results.
- ◆ Irradiance energy can be accurately controlled. The "Closed-Loop" control system can automatically compensate the change of light intensity caused by ageing or other factors.
- ◆ Users can easily calibrate and adjust the irradiance or the black panel temperature by themselves.
- ◆ With High precision Pt100 Temperature sensor. Black panel temperature is auto-controlled during the whole process
- ◆ Alarm function for protection: Over temperature of BPT, big error for irradiance, auto shut-down protection when opening door, protection for too low air pressure
- ◆ Touch screen and user-friendly operation interface allow operator to set the test parameters and monitor all the test process easily.
- ◆ Specimen mounting and evaluation is fast and easy With unique slide-out specimen tray
- ◆ Real-time data can be collected and recorded. The incidental USB connector allow users to copy the test data into a USB drive, achieving unattended operation.



Large exposure area



Various optical filters



Flip design is convenient for lamp installation and maintenance

Technical Parameters

- ★ Xenon Lamp: one 1.8KW xenon lamp imported from America
- ★ Filter: Extended UV filter (Also can choose daylight filter or window glass filter)
- ★ Irradiance monitor methods: 340nm or 420nm (Narrow band) or 300nm ~ 400nm (Broad band)
(Choose anyone before ordering)
- ★ Lamp Lifetime: Near 1,500 hours
- ★ Exposure Area: 1,000 cm² (can put 9 standard samples 150 × 70mm)
- ★ Adjustable Irradiance Range: 30W/m² ~ 100 W/m² (300~400nm) or 0.3W/m² ~ 0.8 W/m² (@340nm) or 0.5W/m² ~ 1.5 W/m² (@420nm)
- ★ Adjustable Black Panel Temperature Range: RT+20°C ~ 90°C (Depends on environment temperature and setting irradiance value)
- ★ Interior Material of Chamber: Stainless steel –SUS 304 material
- ★ Exterior Material of Chamber: Powder coating
- ★ Overall Size: 950mm × 570mm × 540mm
- ★ Net Weight: 93KG (130KG Gross weight)
- ★ Power Supply: 220V 50/60HZ (Alternative)
- ★ Max Current: 12A; Max.Power: 2.5 kW
- ★ **Ordering Information:**
 - BGD 865/A---Bench Xenon Test Chamber
 - BGD 8156--- American Xenon Lamps (1.8 KW)
 - (See page19 for Xenon Calibration Radiometer)

BGD 866/A Small Xenon Test Chamber



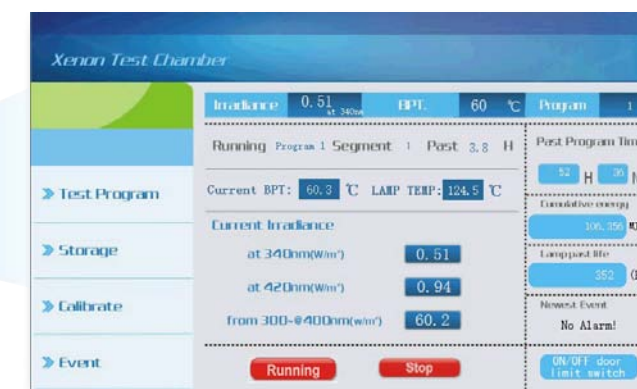
Introduction

Compared with BGD 865/A, BGD 866/A adds spray function. Spray function is used to simulate rain and humidity when the material is used at outdoor. Furthermore, operator can set the cumulative energy (Total irradiance energy) obtained by sample to stop a test procedure.

Operator can set all required test parameters (Irradiance, test time, BPT etc) through the touch screen, and can check its running status at any time. All running parameters can be exported to computer through the USB interface.

Touch screen operation interface

Simply you touch the screen, the operation can be completed.



Procedures can be set freely

The test procedures can be programmed freely; and up to 6 predetermined procedures can be saved in one time. Every procedure includes up to 10 segments setting data.

Characters

- ◆ The test procedures can be programmed freely; and up to 16 predetermined procedures can be saved in one time. Every procedure includes up to 10 segments setting data.
- ◆ Can set the cumulative energy (total irradiance energy) obtained by sample to finish a test procedure.
- ◆ With spray function, can set spray time and spray interval time.
- ◆ The xenon light source correspond with international standards; ensure reproducibility and comparability of testing results.
- ◆ Irradiance energy can be accurately controlled. The "Closed-Loop" control system can automatically compensate the change of light intensity caused by ageing or other factors.
- ◆ Users can easily calibrate and adjust the irradiance or the black panel temperature by themselves.
- ◆ With High precision Pt100 Temperature sensor. Black panel temperature is auto-controlled during the whole process
- ◆ Show the relative humidity of working room
- ◆ Alarm function for protection: Over temperature of BPT, big error for irradiance, auto shut-down protection when opening door, protection for too low air pressure
- ◆ Touch screen and user-friendly operation interface allow operator to set the test parameters and monitor all the test process easily.
- ◆ Specimen mounting and evaluation is fast and easy With unique slide-out specimen tray
- ◆ Real-time data can be collected and recorded. The incidental USB connector allow users to copy the test data into a USB drive, achieving unattended operation.



Spray function

With spray function, can set spray time and spray interval time.



Unique roll-out sample tray

The unique design allows users to install and evaluate the sample more quickly and easily.



Multiple light filter

By choosing different light filters can simulate different conditions.



Self-controlled BPT

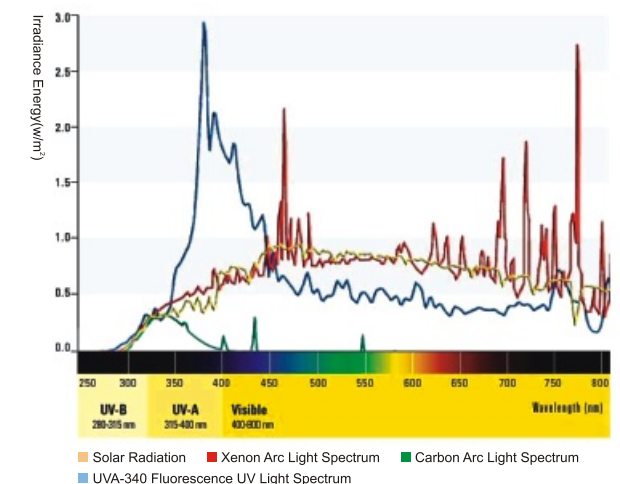
Pt100 black panel temperature sensor with high precision is applied to control the temperature in the cabinet.

Excellent
performance-price
ratio

What is the proper light source?

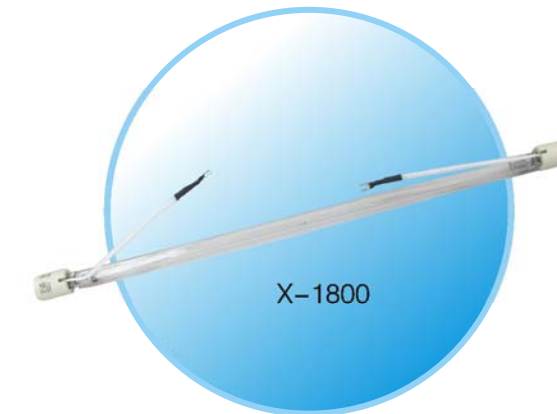
Choosing the proper light source is the basis for establishing accurate and reliable aging tests. B-SUN uses xenon lamps and advanced filters to simulate solar radiation. The xenon lamps are specially designed for aging testing and meet the high performance requirements of spectral distribution. It has lifetime spectral irradiance stability and consistency from batch to batch. According to the user's product environment, B-SUN can be configured with different filters to obtain the closest spectrum.

Wavelength Distribution of Common Light Sources in Laboratory



Standard xenon light source

The xenon light source corresponds with international standards, can reappear the full spectrum sunlight realistically. And it can ensure the test results have good repeatability and comparability. The xenon lamp lifetime can reach 1,500 hours and the price is low. The replacement cost is only one fifth of that of imported instruments, and it is easy for users to replace the lamp.



Technical Parameters

- ★ Xenon Lamp: one 1.8KW xenon lamp imported from America
- ★ Filter: Daylight filter (Also can choose extended UV filter or window glass filter)
- ★ Lamp Lifetime: Near 1,500 hours
- ★ Exposure Area: 1,000 cm² (can put 9 standard samples 150 × 70mm)
- ★ Adjustable Irradiance Range: 30W/m² ~ 100 W/m² (300~400nm) or 0.3W/m² ~ 0.8 W/m² (@340nm) or 0.5W/m² ~ 1.5 W/m² (@420nm)
- ★ Adjustable Black Panel Temperature Range: RT+20°C ~ 90°C (Depends on environment temperature and setting irradiance value)
- ★ Interior Material of Chamber: Stainless steel -SUS 304 material
- ★ Exterior Material of Chamber: Powder coating
- ★ Overall Size: 1000mm × 650mm × 1020mm
- ★ Weight: 135KG (176KG Gross weight)
- ★ Power Supply: 220V 50/60HZ (Alternative)
- ★ Max Current: 12A
- ★ Max.Power: 2.5 kW

★ Ordering Information:

- BGD 866/A---Small Xenon Test Chamber
- BGD 8156---American Xenon Lamps (1.8 kW)
- BGD 8170---Pure Water Machine (50L/h)
- (See page19 for Xenon Calibration Radiometer)

BGD 860 Xenon Test Chamber (New)



Introduction

BGD 860 is a powerful, highly cost-effective, easy to use and convenient to maintain xenon test chamber. It uses an imported air-cooled xenon lamp and relevant daylight filter, to simulate more real and much better the full spectrum sun light of outdoor, ensure the test results obtained from laboratory have a perfect correlation with outdoor application. Furthermore, the samples holder is designed with a special rotating drum to ensure each sample can obtain the same and uniform irradiance during the whole test.

BGD 860 Xenon Test Chamber can meet with all standards requirements from different fields, it can hold 22 pieces samples, not only has spray function, but also can control the relative humidity of working room.

Operator can set all required test parameters (Irradiance, test time, BPT, BST etc) through the touch screen, and can check its running status at any time. All running parameters can be exported to computer directly through the USB interface.



Xenon lamps imported from America
Ensure the test results have a good
repeatability and comparability

Equipped with high precision Pt100 temperature sensor of BPT(Black Panel Temperature), BST(Black Standard Temperature), the working room temperature can be set and controlled precisely and automatically during the whole process(Range: Rt~100℃).

Characters

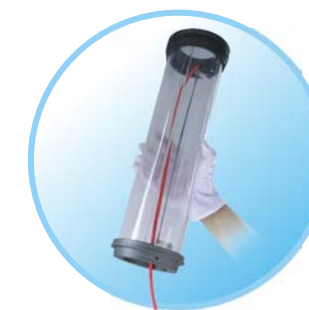
- ◆ Xenon lamps imported from America can ensure the test results have a good repeatability and comparability.
- ◆ Special rotating-drum design for samples holder ensure each sample can obtain the same and uniform irradiance during the whole test.
- ◆ Irradiance energy can be accurately controlled. The "Closed-Loop" control system can automatically compensate the change of light intensity caused by ageing or other factors.
- ◆ Can choose narrow band (at 340nm or at 420nm) or broad band (from 300nm~400nm or from 300nm~800nm) to control irradiance.
- ◆ Affordable air-cooled xenon lamp, the lifetime can reach 1,500 hours.
- ◆ Can choose three different filters (Daylight, Window glass, Extended UV) to meet different test requirements.
- ◆ The test procedures can be programmed freely; can set 10 programs and save 6 predetermined programs in one time. Every program includes up to 10 segments for setting parameters.
- ◆ Can set and control precisely and automatically the relative humidity of working room.
- ◆ Can set the cumulative energy (total irradiance energy) obtained by sample to finish a test procedure.
- ◆ With spray function, can set spray time and spray interval time.
- ◆ Users can easily calibrate and adjust the irradiance or the black panel temperature by themselves.
- ◆ With High precision Pt100 Temperature sensor. BPT (black panel temperature) , BST (black standard temperature) and working room temperature can be set and controlled precisely and automatically during the whole process
- ◆ Alarm and protection function: Over temperature (BPT, BST, Working room) , big deviation of irradiance, shortage of spraying water, abnormal lamp power, big error of humidity.
- ◆ Touch screen and user-friendly operation interface allow operator to set the test parameters and monitor all the test process easily.
- ◆ Real-time data can be collected and recorded. The incidental USB connector allow users to copy the test data into a USB drive, achieving unattended operation.



With spray function



Rotating-drum design of sample holder



Various optical filters

Independently Developed Numerical Control Ballast

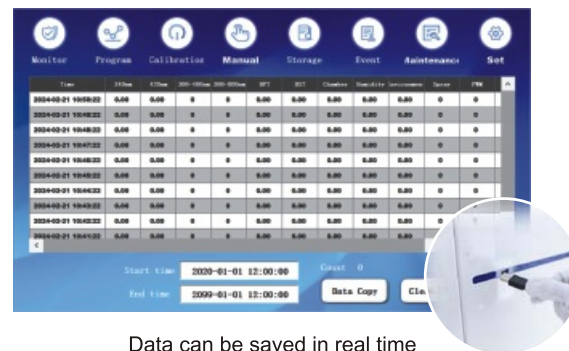


The ballast is developed by Biuged with continuous testing and improvement, which can be said to be the most stable and reliable xenon lamp ballast in the industry.

The circuit boards all adopt the original imported chip. All the power devices adopt IGBT module, with sufficient design margin and perfect protection circuit, which can ensure the long-term stable operation of xenon lamp.



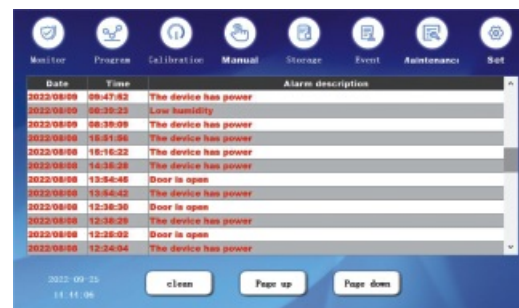
All test parameters can be set



Data can be saved in real time



Precise control of irradiance, temperature, humidity



Alarm protection function

Technical Parameters

- ★ Xenon Lamp: One 1.8KW xenon lamp (imported from America)
- ★ Filter: Daylight filter (Also can choose extended UV filter or window glass filter)
- ★ Lamp Lifetime: Near 1,500 hours
- ★ Exposure Area: 2,200 cm² (can put 22 pcs samples of 150mm × 70mm size)
- ★ Adjustable Irradiance Range:
 - 0.3 ~ 0.75 W/m² (Single point of control: 340nm) 0.5 ~ 1.35 W/m² (Single point of control: 420nm)
 - 30 W/m² ~ 90 W/m² (Full spectrum : from 300 ~ 400nm)
 - 310 W/m² ~ 780 W/m² (Full spectrum : from 300 ~ 800nm)
- ★ Controlling irradiance point: 340nm or 420nm or 300nm ~ 400nm or 300nm ~ 800nm (show at the same time)
- ★ Adjustable Black Panel Temperature Range: RT ~ 100℃
- ★ Adjustable Working room Temperature Range: RT ~ 65℃
- ★ Adjustable relative humidity of working room: 10% ~ 75% (Light) ; 10% ~ 95% (Dark) ;
- ★ Overall Size: 860mm × 800mm × 1770mm Net Weight: 200KG
- ★ Power Supply: AC 380V (Three-phase four-wire system) / 50HZ; Max. Current 16 A
- ★ Max. Total Machine Power: 5.5 kW
- ★ Requirements of 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)
- ★ Ordering Information:
 - BGD 860---Xenon Test Chamber
 - BGD 8150---American Xenon Lamps (1.8kW)
 - BGD 8170---Pure Water Machine (50L/h)
 - BGD 8179---Air Compression System (Includes air compressor, air reservoir, freezing dryer, precise filter etc)
 - BGD 8183---Daylight Filter
 - BGD 8184---Window Glass Filter
 - BGD 8185---Extended UV filter
 - (See page 19 for Xenon Calibration Radiometer)

BGD 862 Plus Big Xenon Test Chamber



Introduction

BGD 862 Plus is a multi-function big xenon light accelerated weathering testers which is equipped with one piece high power (6.5KW) water-cooling xenon lamp, its exposure area arrive 6,500cm²



Unattended operation

TCP/IP Ethernet interface, which allows users to remotely monitor the running status of the instrument. With this interface, operator only needs to set reasonable IP addresses, then can monitor UV working status at any place. Even operator is not in his laboratory, he still can run and maintain UV. Moreover, this function is also convenient for Biuged to help our customers to solve all problems and do some necessary after service. Settle completely user's troubles back at home.

Characters

Powerful functions and reliable test results

- ◆ Meet with all international standards of xenon test.
- ◆ Equipped with USA brand 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
- ◆ 6,500cm² exposure area , can hold different shapes and sizes samples.
- ◆ 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

Remote monitoring and cloud data services

- ◆ Remote monitoring of all the running conditions of Xenon Test Chamber, and storing data in Cloud Server, which is convenient for users to manage data.
- ◆ With the mobile APP, it is convenient for users to monitor the operation of the instrument at any time.

Can set and control automatically many test parameters

- ◆ Irradiance energy can be set and accurately controlled (340nm, 420nm, 300nm~400nm, 300nm~800nm) . The "Solar Eye" control system can monitor and automatically compensate the change of light intensity caused by ageing or other factors.
- ◆ Working room temperature, BPT (black panel temperature) and BST (black standard temperature) can be set and controlled automatically. With high precision Pt 100 temperature sensor, all these temperatures could be monitored accurately.
- ◆ Working room relative humidity can be set and controlled automatically. With ultrasonic wave humidifying system, the working room can obtain more stable and uniform humidity distribution.
- ◆ Can set spray way to sample (front spray or back spray) , spray time and spray interval time.

Simple, easy to use

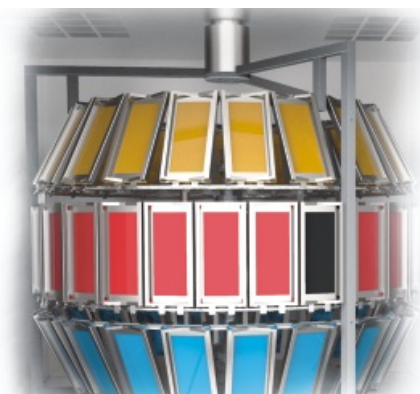
- ◆ Colorful touch screen and user-friendly operation interface allow operator to set the test parameters and monitor it easily.
- ◆ The test procedures can be programmed freely, and up to 6 predetermined procedures can be saved in one time.
- ◆ With USB interface, operator can export any test parameters with Excel format at any time, convenient to check B-SUN's running status at any time.
- ◆ Equipped with pure (deionized) water machine. With high purity water, operator can get a more reliable testing result. Chamber has alarm function for monitoring water.
- ◆ Special test sample shelf size and clamping mode can be customized according to customers requirements.

Safe and reliable

- ◆ Many alarm protections: Big irradiance difference, water conductivity is over limits, too high temperature of cooling water, too low flow rate of cooling water, over-temperature, heating problem. B-SUN will stop running automatically and show the alarm information in the operation window.
- ◆ Can select TCP/IP Ethernet interface, the user can tele-control the machine through TCP/IP internet. Convenient to help customers to solve all problems and do some necessary after service.



Operation Menu



Working room



Automatic irradiance calibration

Users can easily calibrate and adjust the irradiance by themselves. By using the irradiance meter, the user only needs to input the values read from the calibrator, then press "confirm", and the whole calibration process will be completed automatically.



Convenient installation of sample holder

Sample holder can be swapped position with each other at every a period time, so as to ensure that uniform irradiance is more reasonable. It makes the same batch of test samples have good data comparability.

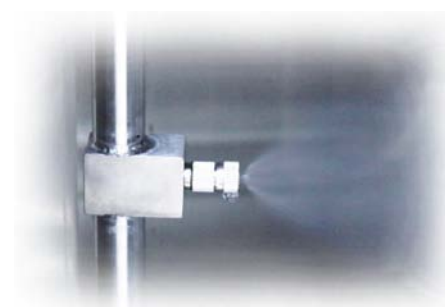


High precision temperature sensor

With high precise Pt 100 black-panel and black-standard temperature sensors; the chamber temperature, same as the black-panel temperature, is controlled automatically (Rt ~ 110°C).

Spray system

B-SUN spray system was designed with 12 nozzles (6 of them in one group) which can spray to the front or the back of the test panels. Spray system can run a few minutes and then shut down. This transitory water spray can cool the samples quickly, creating heat shock conditions. Furthermore, all the B-SUN can run the water spray during either light or dark cycle. Using Siemens PLC programmable controller, the spray time and spray interval time can be set in the program. Operator can also directly set the spray mode of the template (front spray or back spray).



Main Technical Parameters

Ordering Information → Technical Item ↓	BGD 862 Plus Xenon Test Chamber	
Xenon Lamp	6.5 kW water cooling long arc xenon lamp	
Light Filter	Import originally from America, can simulate indoor or outdoor sunshine spectrum	
Exposure Area	6,500 cm ² (63–65 pcs standard samples of 15cm × 7cm size)	
Monitoring Method to Irradiance	Four types: 340nm, 420nm, 300nm ~ 400nm, 300nm ~ 800nm	
Adjustable Irradiance	See Table B.	
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	The water consumption for 24 hours is 300L–400L.(Taking the continuous run of cycle A for 24 hours in ISO 11341 standard as an example)	
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	

Table A: Main Configuration

Products	Numbers	Manufacture	Notes
Xenon Lamp	1pc	USA brand	6.5kW
Filter	1set	USA brand	Includes five inner filters and one 4.5K/6.5K outer filter (S BORO/S BORO)
Control System	1set	SIEMENS	S7–SMART PLC+ Siemens analog input
Interface	1pc	Industrial control integrated computer	15" human–computer touch screen

Table B: Adjustable Range of Irradiance

Combinating Filters			Adjustable Range of Irradiance (W/m ²)			
Filters	Inner Filter	Outer Filter	Lamp Power (kW)	340nm	420nm	300–400nm
Daylight	Type S Boro	Type S Boro	2.5 ~ 7.5	0.25 ~ 1.26	0.59 ~ 2.76	29 ~ 141
Window Glass	Type S Boro	Soda Lime	2.5 ~ 7.5	0.23 ~ 1.10	0.61 ~ 2.76	28 ~ 129
Extended UV	Quartz	Type S Boro	2.5 ~ 7.5	0.29 ~ 1.50	0.59 ~ 2.79	32 ~ 161

Optional Accessories

BGD 8158----USA brand 6.5KW Xenon Lamp (Water–cooled)

BGD 8159----6.5KW Xenon Lamp (Water–cooled) imported from America

BGD 8160----USA brand 2,000 HRS Supply PKG (Includes one BGD 8158 USA brand 6.5KW water–cooled lamp, 5pcs S65 inner filters, onepc 4.5K/6.5K outer filter)

BGD 8161----6.5KW BGD 2,000 HRS Supply PKG (Includes one BGD 8159 6.5KW water–cooled lamp imported from America, 5pcs W–143 inner filters, one PC W–144 outer filter)

BGD 8171----Purity Water System (100L/min, pure water can less than 0.1 μ S/cm (input water < 200 μ S/cm))

BGD 8176----Cooling Water Machine (For cooling and cycling pure water, can greatly reduce water consumption)

BGD 8179----Air Compression System (Includes air compressor、air reservoir、freezing dryer、precise filter etc)

BGD 8186----Daylight Filter

BGD 8187----Window Glass Filter

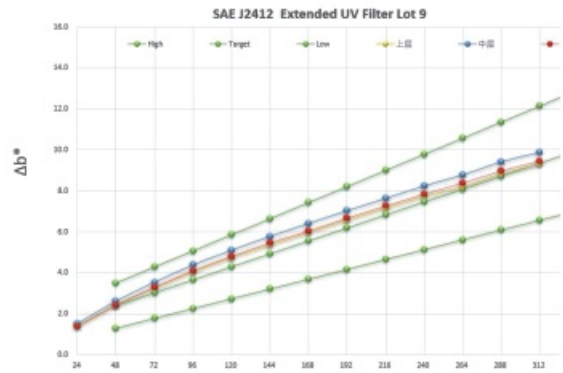
BGD 8192----Metal Frame Air Filters

BGD 8197----Sample shelf

(See page 19 for Xenon Calibration Radiometer)

Validation data of standard PS board

BGD 862 Plus & An imported aging chamber of the same model



BGD 862 Xenon Test Chamber meets the requirements.



BGD 8176

BGD 8171

Multifunctional Irradiance Radiometer



Introduction

For all artificial light accelerated aging test chamber, irradiance (irradiation energy) is one of the most important parameters affecting the test results. On the other hand, with the extension of the service time of the aging test chamber, some components (including filters, irradiation probes, sensors, etc.) will age, resulting in deviation of irradiance displayed on the instrument. Therefore, regular calibration of the irradiation energy of aging instrument is a necessary operation in the process of artificial accelerated aging test.

The multifunctional irradiance radiometer is a brand-new hand-held instrument produced by Biuged. It includes a hand-held irradiance radiometer (main body) and one or more special probes. When using, select the corresponding probe and insert the irradiance radiometer according to the required calibration object, and select the lamp or filter type in the radiometer display screen. Then place the probe in the calibrated instrument and start the aging test chamber, and calibrate the irradiance in the aging test chamber by reading the value displayed on the irradiance radiometer. On the other hand, when the probe is inserted into the irradiance radiometer, its display screen will automatically read and display the factory number and calibration date of the probe, so that the user can calibrate the probe in time.

The multifunctional irradiance radiometer can be used to calibrate the irradiance of all aging test chambers (including xenon lamps and fluorescent ultraviolet) produced by Biuged. Compared with other irradiance radiometer on the market, the multifunctional irradiance radiometer has the following characteristics:

- ◆ After inserting the calibration probe, the main body automatically recognizes the type of the probe and its relevant parameters.
- ◆ Xenon lamp calibration probe, which can simultaneously calibrate the irradiance of air-cooled and water-cooled xenon lamps and different filters.
- ◆ UV calibration probe can simultaneously calibrate the irradiance of different types of fluorescent ultraviolet lamps (UVA / UVB).
- ◆ 5-inch capacitive LCD touch screen with HD resolution of 1080×720.
- ◆ The modular irradiance probe is adopted, which is lower in cost than the traditional instrument with integrated probe and host.

- ◆ After the validity period of the self-identification probe expires, the user can choose to recalibrate or replace it.
- ◆ Built in Chinese and English languages for users to switch.

Technical Parameters

- ★ Range: 0.00~2.00W/m²(340nm); 0.00~4.00W/m² (420nm)
0~300W/m² (300nm~400nm/TUV);
0.00~2.00W/m² (UVA&UVB)
- ★ Irradiance error: ± 10%
- ★ Recommended Calibration Period: one year
- ★ Probe Temperature Drift of probe: ± 0.02%/°C
- ★ Operating Environment: 0 ~ 50°C; 10% RH ~ 90% RH
- ★ Maximum Working Temperature: 70°C
- ★ Main Body Size: 143mm × 75mm × 20mm
- ★ Net Weight (main body and probe): 380g



Ordering Information:

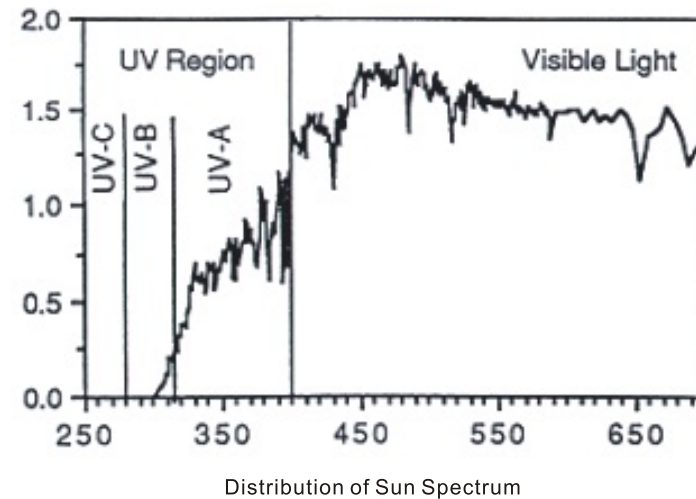
BGD 8118/S--Multifunctional Ultraviolet Irradiance Radiometer (UVA&UVB)
 BGD 8140/S--Multifunctional Xenon Lamp Irradiance Radiometer (340nm)
 BGD 8141/S--Multifunctional Xenon Lamp Irradiance Radiometer (420nm)
 BGD 8142/S--Multifunctional Xenon Lamp Irradiance Radiometer (300nm~400nm)
 BGD 145--Multifunctional Irradiance Meter Body
 BGD 8134--300nm~800nm Xenon Lamp Irradiance Calibration Probe
 BGD 8136--340nm Xenon Lamp Irradiance Calibration Probe
 BGD 8137--420nm Xenon Lamp Irradiance Calibration Probe
 BGD 8138--300nm~400nm Xenon Lamp Irradiance Calibration Probe
 BGD 8139--UVA&UVB Ultraviolet Irradiance Calibration Probe

UV Light Accelerated Weathering Tester

Test Principle



The ultraviolet rays of sunlight are the main factor who damage weathering resistance of most materials. We use UV lamps to simulate the short wave part of sunlight, it produces few visible lights and infrared lights. According to different testing requirements, we choose different wavelength UV lamps, this is because each type UV lamps produce different irradiance energy and wavelength. Generally speaking, UV lamps can be divided into UVA and UVB



Different types fluorescent UV lamps are used in different fields, for example:



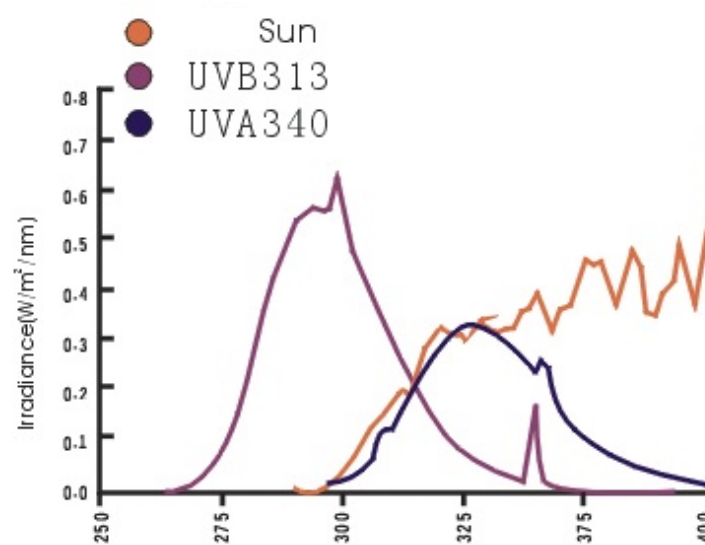
① UVA-340 Lamp: UVA-340 lamp can highly simulate short-wave ultraviolet light of sunlight, the wavelength range is from 365nm to 295nm.

② UVA 351 Lamp: Simulates UV sunlight which has passed through the windows. It is excellent for testing materials aging process indoor.

③ UVB 313 Lamp: UVB-313 lamp emits stronger shortwave ultraviolet light compared with the ultraviolet rays on earth, thus can accelerate material aging process. However, this lamp may cause some unrealistic material damage. It is mainly used in quality control, research and development, and the test of the materials with strong weather resistance.

④ QFS-40 Lamp: is also called FS-40 or F40UVB, which is the original QUV lamp tube. FS-40 lamp is still used in some traditional automotive test.

In the meantime, its inner temperature and humidity can be properly controlled to obtain the periodic precipitation on the sample for fully evaluating the damaged factor caused by sunlight, moisture and temperature (materials aging phenomenon includes fading, dis-luster, intensity reduction, cracking, flaking, chalking, and oxidation). Compared with xenon lamp aging test, fluorescence ultraviolet light can provide more severe and faster accelerated aging test.



BGD 852 Bench UV Light Accelerated Aging Chamber



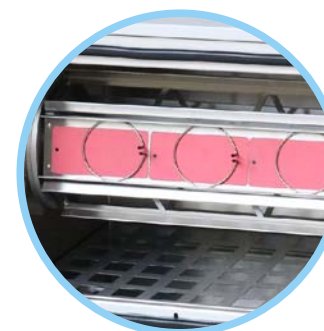
Introduction

BGD 852 Bench UV light Accelerated Aging Chamber is an economic and easy-to-use machine which can meet some customers' requirements. It is equipped with 3 pcs 20W UVA or UVB lamps as light sources. Operator can set the total illumination time, temperature, spray time etc to simulate the natural environment which would cause the damaged factor to samples.

This chamber can isolate 18 pcs standard panels (Size is 150mm×70mm). Samples are installed a column form rotating sample rack. During the test, the sample rack rotate uniformly and ensure every sample get the same irradiance energy, increase the comparability and repeatability of testing results.

Features:

- ◆ Touch screen and user-friendly operation interface allow handlers set the test parameters and monitor all the test process easily.
- ◆ Equipped with professional UV lamps who has high irradiance energy: 0.70W/m² (New UVA lamp)
- ◆ Full stainless steel inner working room with sandwich design, never getting rusty and leakage. Also prevent water vapour coming from working room from entering electrical box and damaging electron components.
- ◆ Built-in water level switch, it will alarm and stop running automatically when under low water level.



Rotating-drum sample holder



Large touch screen



Alarm function for protection

Technical Parameters

- ◆ Total Power: 1.2 KW
- ◆ Settable Temperature Range of Working Room: RT+5°C~60°C
- ◆ Adjustable Range of Test Time: 1h~99,999h
- ◆ Adjustable Range of Spray Time: 1min~99,999min
- ◆ Adjustable Range of Spray Interval Time: 1min~99,999min
- ◆ Rated Life of Lamp: 1,000h
- ◆ Wave Length of Lamps: 313nm(UVB Lamps) or 340nm(UVA Lamps)
- ◆ Lamp Power: 3pcs ; each lamp is 20 W
- ◆ Water Consumption for Spray: 3L/min
- ◆ Capacity for Test Panels: 18pcs standard size panels
- ◆ Specification of Sample: 150mm × 70mm
- ◆ Cabinet Size: 940mm × 490mm × 630mm(L × W × H)
- ◆ Net Weight: 72KG
- ◆ Power Voltage: 220V/50HZ, 6A



Ordering Information:

BGD 852---Bench UV Light Accelerated Aging Test Chamber

BGD 8100 ---UVB Lamps (20W/313nm)

BGD 8101---UVA Lamps (20W/340nm)



BGD 856 UV Light Accelerated Weathering Tester



Introduction

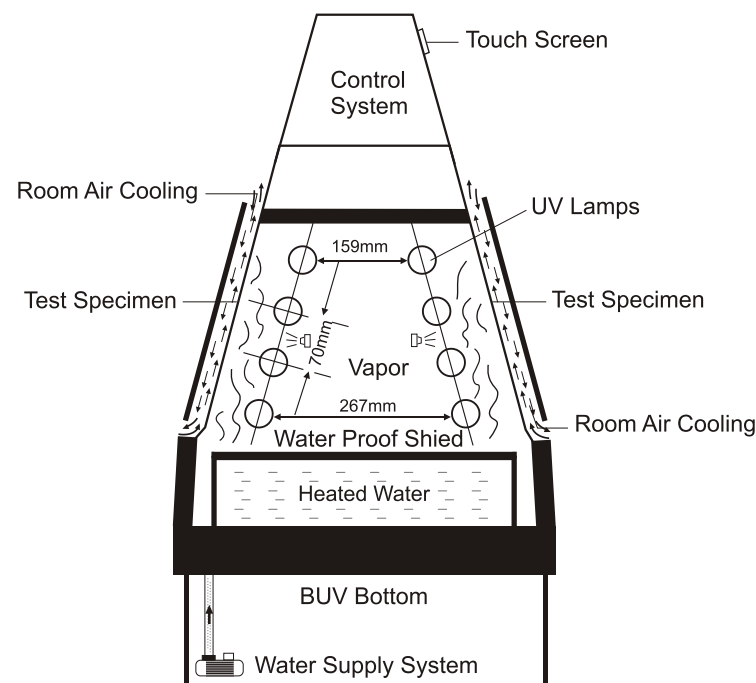
BGD 855 & 856 UV Light Accelerated Aging Test Chamber (hereinafter referred as BUV) adopts fluorescent UV lamp as the light source. Its inner temperature and humidity can be properly controlled to obtain the periodic condensation on the sample for fully evaluating the damaged factor caused by sunlight, 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 16474-1** 《Paints and varnishes — Methods of exposure to laboratory light sources — Part 1: General guidance》
- ◆ **ISO 16474-3** 《Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps》
- ◆ **ISO 11507** 《Paints and varnishes--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



Technical Parameters

- ◆ Light Source: UV-A (wave length 340 nm) or UV-B (wave length 313 nm) ; 40W × 8 purchase
(The normal use-life is 6,000 hours)
- ◆ The range of Irradiance: $0.1 \text{ W/m}^2 \sim 1.55 \text{ W/m}^2$
- ◆ Temperature Range: Black Panel Temperature (BPT) : $RT+10^\circ\text{C} \sim 80^\circ\text{C}$
- ◆ Interior of cabinet: Stainless steel –SUS 304 material
- ◆ Exterior of cabinet: Powder coating on SUS 304
- ◆ Insulating Area: $5,175\text{cm}^2/828\text{in}^2$
- ◆ Sample Capacity: 48 pieces of standard specimen (70mm × 150mm standard samples)
or 15 pieces of 100mm × 300mm
- ◆ Adjustable range for water supply: 0–4LPM
- ◆ Water Consumption: 7L/day (for condensation) ; 3L/minute (for spray)
- ◆ Overall Size: 1,360mm × 560mm × 1,290mm (L × W × H)
- ◆ Net weight: 161KG
- ◆ Total Max. Power: 2kW
- ◆ Power: 220V/50HZ (60 HZ is custom) , 10A (Max Electric Current)

Characters

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

All BUV 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 BUV 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 BUV 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 decrease continuously. For some high set point of irradiance, BUV couldn't keep this irradiance any longer, and now the system of BUV would reminder failure “the error of irradiance is too large” and shut off the machine. Now, the operator should calibrate the BUV 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.

BUV is calibrated by BGD Calibration Radiometer which is produced by our company. User can use one radiometer to calibrate some BUV, radiometer can test fluorescent UV lamps. It is not only used to calibrate the UVA lamps, but also to do UVB lamps.

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



Calibration Radiometer



BUV Calibration Window

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. BUV water spray can simulate this heat shock and / or stress corrosion.

BUV 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. BUV 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.

◆ Control the temperature automatically with high precision Pt 100 temperature sensor of black Panel.

In each cycle, the temperature can be controlled at a set value. At the same time, the black panel thermometer can monitor the temperature. Temperature increase can accelerate the aging process, and the temperature control for reproducibility of the test is also very important.

BST (Black panel thermometer) consists of a PT100 sensor and a metal panel painted by black coating, and be exposed to the same condition as test panels. It's used to monitor exposing test panels surface temperature during test. BST can be set any value according to different requirements and also be controlled automatically during the whole test. It also can be calibrated periodically.



BUV main Window



BUV Set Test Program Window

◆ Confirms to many test standards. Operator can set different program freely.

According to different standards or test methods, operator can edit different test programs. For each program, it can be set as 10 segments, and each segment can set different work conditions (four types: Irradiation, water spray, condensation and finish) as well as relevant test parameters.

BUV can permit operator to edit six test programs at most and save it permanently. Generally speaking, if the operator has set and saved one program in the BUV, for next test, if he still use this same program, just choose this program and run BUV directly, no need to set again.

◆ Controlled by touch screen with friendly windows, user can check any parameter during test

BUV all controllings and showings are finished by a high definition colorful touch screen. Menu operation interface is very convenient for operator to use and maintain BUV. During the working, all parameters are show on the touch screen.

◆ Real-time collect and store data, all testing data can be converted EXCEL format automatically and be saved.

There is a USB interface at the BUV back, through this interface, operator can export all running parameters at any period by a U disk. It's convenient for operator to search and do statistics for BUV, and achieve the real unattended running.



BUV Import Data Window

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

◆ Come with TCP/IP Ethernet interface, the user can tele-control BUV through TCP/IP internet.

With this interface, operator only need to set reasonable IP address, then can monitor BUV working status at any place. Even operator is not in his laboratory, he still can run and maintain BUV. Moreover, this function is also convenient for Biuged to help our customers to solve all problems and do some necessary after service. Settle completely user's troubles back at home.

◆ Come with a booster pump, even the user's external water pressure is not enough, BUV still can work normally with this booster pump.

◆ Alarm and protection functions: Water shortage, over-temperature of black panel, large deviation of irradiance between setting value with showing value.



Ordering Information:

BGD 855 --- Basic Ultraviolet Light Accelerated Weathering Cabinet

(No irradiance control)

BGD 856 --- Ultraviolet Light Accelerated Weathering Cabinet

BGD 8110 --- UVB lamps (40W/313nm)

BGD 8111 --- UVA lamps (40W/340nm)

BGD 8118/S --- Calibration Radiometer (310nm&340nm)

BGD 8130 --- Sample Shelf



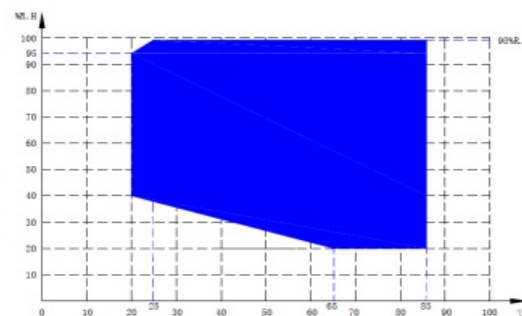
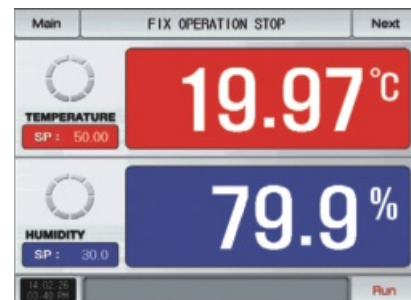
BGD 8118/S

BGD 897 High-Low Temperature & Humidity Cabinet



Introduction

These new programmable cabinets with a precise system of temperature and humidity control, which provide various necessary environmental simulative conditions for industrial research and biotechnology tests. Widely applied in sterile tests and stability check-up of pharmaceuticals, textile and food processing as well as tests in material performance, packing and lifetime of industrial products.



Note: Temperature and relative humidity influence each other, for Biuged Climate chambers, controllable area is remarked by blue area as above picture

Technical Parameters

- ★ Temperature Uniformity: $\pm 2^{\circ}\text{C}$
- ★ Humidity Uniformity: $\pm 2\% \text{RH}$
- ★ Temperature Stability: $\pm 0.5^{\circ}\text{C}$
- ★ Humidity Stability: $\leq 2\% \sim 3\% \text{Rh}$ ($\geq 75\% \text{RH}$)
or $\leq \pm 5\% \text{RH}$ ($\leq 75\% \text{Rh}$)
- ★ Temperature Increasing Rate: $\geq 3.5^{\circ}\text{C} / \text{min}$ (no-load, average value during the whole test)
- ★ Temperature Decreasing Rate: $1^{\circ}\text{C} / \text{min}$ (no-load, average value during the whole test)
- ★ Power Supply: 220V/380V; 50Hz
- ★ Total Power: 5.5kW

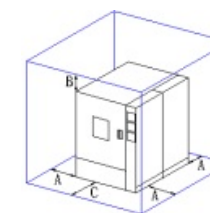
Ordering Information	Temperature Range	Humidity Range	Total Power/Max. Current	Working Room Size (W×H×D, mm)	Overall Size (W×H×D, mm)
BGD 897/100B	-20 ~ 150°C	20 ~ 98%	4.6KW/16A	400 × 500 × 500	900 × 1400 × 1150
BGD 897/100C	-40 ~ 150°C				
BGD 897/100D	-60 ~ 150°C				
BGD 897/225B	-20 ~ 150°C		5.5KW/22A	500 × 750 × 600	1000 × 1650 × 1250
BGD 897/225C	-40 ~ 150°C				
BGD 897/225D	-60 ~ 150°C				
BGD 897/608B	-20 ~ 150°C		11KW/12A (380V; 3 phase and 4 wires)	800 × 950 × 800	1300 × 1850 × 1400

1.0 Structure Feature

Chamber Structure	Internal material: 304# stainless steel with thickness is 1.2mm External material: 1.2mm baking finish cold roll steel plate with advanced static electricity spray process. Heat preservation material: polyurethane foam rubber with 100 mm thick Others: install the positioning foot cup and movable trundles under the test chamber bottom; top of chamber equips automatic pressure relief hole, bottom of inner chamber equips drainage hole, can drain out condensate water quickly
Air Adjustment Channel	Inside air space, recirculating wind channel and stainless steel cycle fan, through the top window and air diffuser, the wind will out uniformly from the top, let the reconciled temperature from the harmonic room diffuses to the test area, which could reach the purpose of control temperature uniformly.
Chamber Door	◆ Single open door ◆ Anti-explosion ◆ Anti-condensation electric heating device ◆ Vacuum auto-defog transparent window ◆ Window floodlight
Cable Port	Install a $\Phi 50\text{mm}$ test hole on the left of the machine, and equip related seal device for connecting with power test
View Window	Designed in the door with 230 × 270mm transparent electric radiant heating film with cavity toughened glass(equipped with anti-condensation function)

Control System	TEMI 1500 Touch Screen LCD, imported from Korea, floodlight switch, main power switch
Cooling System	Refrigeration system, heating device, fan, dewatering device, adjustable back window
Sample Shelf	Adopt 304# stainless bent into net sharp, easy for use, the distance between the material frame could be adjusted(the smallest distance is 50mm), standard equipped two pieces
Electrical Room	Main power breaker, controller, distribution plate, radiating fan, over temperature protector
Heating System	Adopt the scale heat rejection heating pipe P.I.D. control the heating so let the temperature gets the balance
2.0 Refrigerating System	
Refrigeration Method	To keep the cooling rate and minimum temperature requirement, we use single stage refrigeration system
Refrigeration Compressor	Adopt low temperature compressor from European
Cooling System	Air-cooled scale condenser, circulating fan for heat dissipation
Evaporimeter	Finned tube heat exchanger
Throttling Device	Thermostatic expansion valve, capillary tube
Dry filter	Absorption for the residual water and acidic material from refrigerating fluid in refrigerating system, filtrate the solid impurity grain, copper cuttings of system, keep the normal working of expansion valve and capillary, in case of ice blockage and filth blockage
Refrigerating Fluid	Adopt environment protected refrigerating fluid R404A
3.0 Electrical Control System	
Controller	Korea SAMWON, LCD touch screen controller TEMI 1500
Display Interface	◆ Display screen dimension: 5.7 inches colorful touch screen conversational mode ◆ Temperature set value (SV), current value (PV) displays directly ◆ Can display the temperature output value ◆ The execute program number, section, procedure time and time signal control condition can be displayed ◆ Can display auto-calculus picture and procedure standby light-flooding picture ◆ Can display record data and curve condition picture ◆ Can display current curve and edit procedure curve and history running curves ◆ Can display fault indicated and simple fault exhaust
Communication	RS-232 communicate interface, can used as monitoring and remote control system, record the test data
Running Method	Program mode / definite value mode
Set Method	English interface, touch screen input
Procedure Capacity And Control Function	◆ Operational procedure capacity: max:120 groups; one procedure could consist of 1 to 99 sections. ◆ Operational memory capacity: 1200 sections, could repeat executive command: each command could repeat 999 times, the slope setting of the procedure could be set through the timer shaft, the joining use could be set among the procedures, the procedure making can adopt dialogue type, easy to operate with edit, eliminate and insert function, 4 groups of time signal output control (can control the test sample ON/OFF option). ◆ 9 groups of PID parameter setting, the procedure will have the overleap section, keep functions; can show the curve and data collection; date and time adjustment function; button and picture lock (LOCK) function; can connect the computer, 8 points of DI abnormal input and 10 points of DO signal control
SD Storage Card	Used to store test date and test curve, standard storage capacity is 2G, storage time is about 2 years
Setting Range	Up/down limitation of maximum temperature range is 5°C
Display Resolution	Temperature: 0.01°C; time: 1min;
Memory Function when Power off	Can set recovery mode in case of power off: heating/ cold/ stop
Make an appointment function	Can set available machine time randomly, after turn on the power, the machine will run automatically
Input	PT100 type platinum resistor
Make an appointment function	Can set available machine time randomly, after turn on the power, the machine will run automatically

Input	PT100 type platinum resistor
Curve record function	Equip with battery protection RAM, can save the set value, sampling value and sampling time of the machine; Max record time is 60 days (when the sampling cycle is 1.5min)
Software use environment	IBM PC compatible machine, above P II CPU, more than 128M RAM, simplified Chinese Windows2000 or simplified Chinese WindowsXP operation system.
Circulating fan	Low noise with many wing centrifugal fan
Heater	Import nichrome electronic heater and heater control mode is contactless equal cycle recurrent pulse adjust wide, SSR (solid-state relay)
Control Mode	Anti-integral saturation PID, BTC balance adjust temperature control mode (temperature test equipment)
4.0 Humidify and Dehumidify System	
Water Supply	Big water tank
Humidify And Dehumidify Method	Adopts outer humidify, compressor start to dehumidify, P.I.D controls the humidify volume to reach the need humidity
Water Quality Request	Resisitivity $\geq 500\Omega \cdot m$
Water Supplement Method	Chamber reserves the water supplement port and water level viewing window, please supply water when the water level is too low
Humidify Water Supply	Inner equipped with a micro water pump, and only needs to add water to the water tank. The water pump is automatically added to the humidifying boiler according to the water level in the humidifying boiler
5.0 Safety Protection Device	
Refrigerating System	Compressor overheat/over current/ over pressure, condensation fan overheat
Test Chamber	Over temperature limitation, fan/motor over temperature relay
Power	Earth leakage protection, overload protection, short-circuit protection
Installation Site Requirement	◆ the distance between the wall and left/right/back should be at least 600mm(A/B) ◆ the distance between the wall and the front side of the machine should be at least 1200mm(C) ◆ please make sure the gate, gallery and elevator could pass the machine in case of affect to your company normal working
Storage Environmental Requirement	Environmental temperature of the machine keep within 0°C ~ +40°C



Biuged-Designed Control System



Controller TEMI 1500



Refrigeration compressor from Europe

BGD 880/T New Programmable Salt Spray (Fog) Cabinets



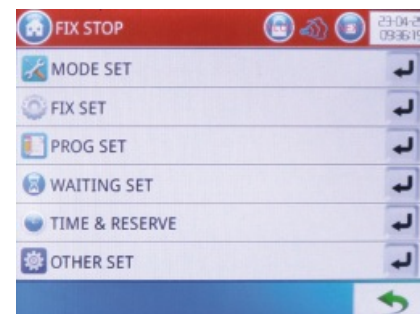
Introduction

BGD 880/T、BGD 881/T、BGD 882/T are whole new salt spray cabinets which are developed by Biuged recently. They have many typical advantages besides those characteristics of BGD 88* series products .

◆ The temperature of working room is controlled by air heating: The outer layer of inner plate is installed with electric heating wires, and the ambient temperature of the chamber is quickly heated to the desired temperature value by thermal radiation. The concentration and PH value of the spray solution will not be affected by any factors. The heater uses P.I.D to control heating so as to achieve temperature balance.

◆ Reasonable cabinet structure, durable material and beautiful shape: Cabinet inner material is made by Titanium plate, outer is made by steel plate with painting treatment. Hidden water gauge for salt solution supplement system, easy to clear without easy to break. Cabinet cover is inclined plane type, to prevent the water to sample surface. Seal cover is driven by air cylinder, just click lift and fall button to open and close chamber cover. Sealed by silica gel seal strip for cabinet to prevent any leakage of corrosion gas. Water and electricity is completely separated in whole cabinet, effectively prevent water from entering electrical control box to damage parts.

◆ New designed standard sample holder: The top of working room is equipped with a plane dividing rack. The sample rack is divided into upper, middle and lower layers. The upper layer is equipped with circular rods made of corrosion-resistant materials. The middle layer is equipped with V-shaped glass fiber material brackets. The sample can be placed by adjusting the angle between V-shaped brackets and circular rods by $20^{\circ} \pm 5^{\circ}$. The lower layer is equipped with a plane mesh plate for placing large pieces of samples and mesh plates. Bearing weight uniformly distributed at more than 200 kg

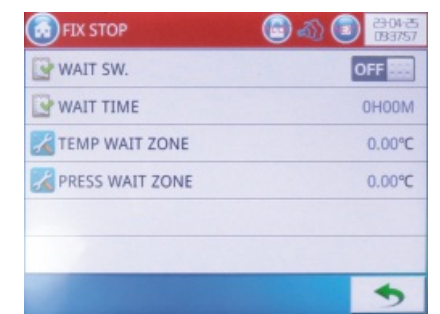


◆ Sprayed solution supply system: External big capacity tank for sprayed solution (salt water) , and the salt water is absorbed by the peristaltic pump to supply the nozzle, thereby avoiding the problem of the crystallization of the traditional siphon spray nozzle . Moreover, the flow rate of the peristaltic pump can be regulated and controlled, and the average rate of collection of spray solution is effectively guaranteed.

◆ All testing parameters can be set by programmable controller TEMI 880 (touch screen) : 5.7 inch and 800×480 lattice, TFT color LCD display, English menu, input by touch screen. Can set all parameters inquired by standard, such as spraying methods and spraying cycle (Fog spray cycle: continuous fog spray max test time is 999.9 hours, interval fog spray max spraying time is 99 hours 59 min, max stop time is 99 hours 59 min)

◆ Advanced communication function: RS 232 interface , have local and remote communication function (need to equip RAS-2003 monitor software, max. 16 apparatus can be connected at the same time) . Come with a CD of software for PC, user can edit any test program through software and save it in U-disk, then call it out and save in controller. Also can shift any program saved in controller to U-disk, then analyze and manage it in PC.

◆ Curve record function: equipped with battery protection RAM, can save the set value, sampling value and sampling time of the machine; Max record time is 360 days (when the sampling cycle is 2min).



Standards

ISO 4611 《Plastics -- Determination of the effects of exposure to damp heat, water spray and salt mist》

ISO 7253 《Paints and varnishes -- Determination of resistance to neutral salt spray (fog) 》

ISO 9227 《Corrosion tests in artificial atmospheres -- Salt spray tests》

ASTM B 117 《Standard Practice for Operating Salt Spray (Fog) Apparatus》

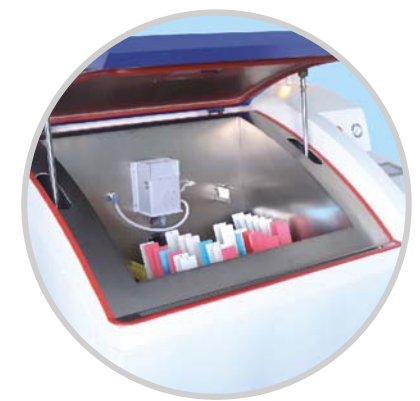
ASTM B368 《Standard Test Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test) 》

ASTM B 380 《Standard Test Method for Corrosion Testing of Decorative Electrodeposited Coatings by the Corrodokote Procedure》

ASTM G85 - 11 《Standard Practice for Modified Salt Spray (Fog) Testing》

ASTM D 1735 《Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus》

DIN 50021 《Salt Spray Testing》



Technical Parameters

- ★ Working Room Temperature Range: RT+5°C ~ 55°C
- ★ Humidifying Tower Temperature Range: RT+5°C ~ 65°C
- ★ Temperature Uniformity: $\leq \pm 2^{\circ}\text{C}$ (No-load)
- ★ Temperature Stability: $\leq \pm 0.5^{\circ}\text{C}$ (No-load)
- ★ Temperature Deviation of Working Room: $\pm 1.0^{\circ}\text{C}$
- ★ Temperature Increasing Rate: RT→50°C less than 45 minutes (working room)
Rt→63°C less than 45 minutes (saturated barrel)
- ★ Air supply requirements: filtered dry, waterless and oil-less pressure air, pressure 0.4 ~ 0.8Mpa



Ordering Information → Technical Parameters ↓	BGD 880/T	BGD 881/T	BGD 882/T
Working Room Size (W×H×D), mm	1000×650×720	1200×800×1000	1600×800×1000
Working Room Capacity (no including V shape cover)	450 L	960 L	1280 L
Overall Size (W×H×D), mm	1700×1400×1000	1900×1600×1200	2300×1600×1200
Max. Sample Capacity (15cm×7cm)	65 pcs	152 pcs	190 pcs
Sprayed solution tank Capacity (L)	120	300	300
Collectors	2	2	2
Total Power	3.6 kW	4.2 kW	4.6 kW
Salt Solution Consumption	60 L/d	60 L/d	70 L/d
Compressed Air Consumption	2 m³/h	3 m³/h	3 m³/h
Water for heating Consumption	20 L/d	20 L/d	20 L/d
Power Supply	AC (220±10) V; 50Hz; Single-phase three-line		

GLOSS

Gloss is an important attribute of surface appearance, it changes our perception of colors and shapes and influence our overall visual experience.

Gloss affects objects by the interaction of incident light with the surface and observation depends on variables such as illumination angles, surface profile, physical characteristics and observation conditions.

For many products, gloss can play an important part in their visual acceptability and for quality purpose should be monitored with precision instrumentation particularly when it varies through the process. Unified methods for the measurement of gloss as described in ASTM, DIN and ISO standards.

When a defined light source illuminates a surface, it is partly scattered and partly reflected in the equal but opposite angle. This specular reflection determines the surface gloss level. The intensity of the specular reflection, which depends on the material and the illumination angle, is measured under specified conditions. Results are expressed in Gloss Units (GU), which is a calibrated scaling based on the refractive index of a black glass having a specular reflectance of 100 Gloss Units (GU) at the specified angle. All non-metallic materials e. g. paints or plastics can have a value related to this level, while for highly reflective metallic surfaces e.g. plated components and some raw materials can reach 2000GU (mirror gloss).

Our range of instruments offer a variety of measurement geometries each applicable to different gloss measurement applications or materials.

Generally three geometries which cover the majority of industrial applications:

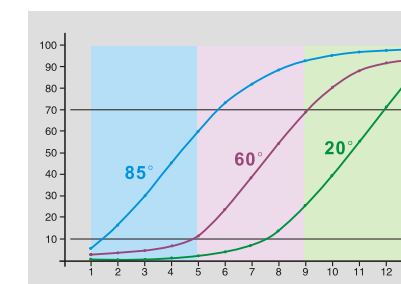
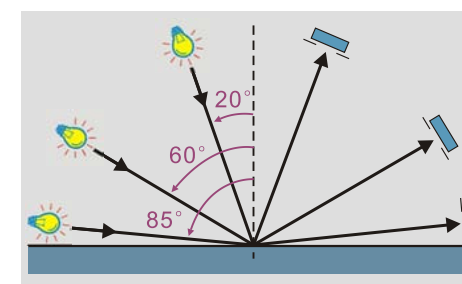
- 20° for high gloss surface
- 60° for medium gloss surface
- 85° for low gloss or matt surface

The 60° geometry is widely used due to its medium gloss coverage. However, it has been experimentally shown that when reading taken at 60° exceed 70 GU, then a change to 20° is recommended for better differentiation. Equally when reading drops below 10 GU the geometry should be changed to 85° for the same reason.

For some specific industrial applications such as the measurement of ceramics, plastics and paper, special 45° or geometries 75° are also available.

All of Biuged glossmeters can meet global standard requirements:

ISO 2813, ISO 7668, ASTM C584, ASTM D523, ASTM D1455, ASTM D2457,
DIN 67530, JIS Z8741, BS 3900, BS 6161



Economic Glossmeter

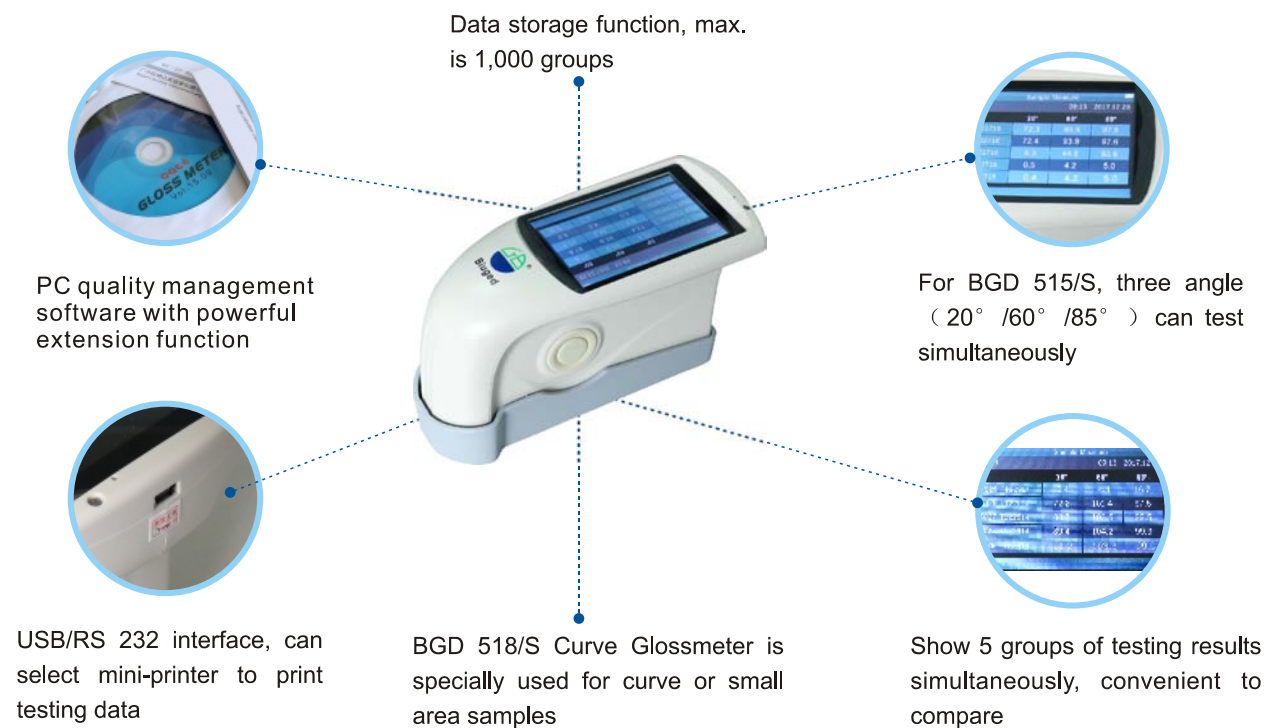


Introduction

These economic glossmeters use plastic shell, in-built standard board and have portable small size. It is designed to measure gloss of paint, film, ink, plastics, stone, paper, tile, enamel, etc.

Characters

- Cost-effective, easy operation, small size, stable performance and high precision
- 3.5 inch color screen, high resolution (480 × 320), full-view
- Chinese and English for selection
- Come with QC software, can inquire and store testing data, or print quality report
- Conform ISO 2813, ASTM D 523, ASTM D 2457 etc
- Auto power-off
- Built-in lithium ion rechargeable battery
- Calibrate automatically when turn on



Technical Parameters

Ordering Information→ Technical Parameters ↓	BGD 512/S Glossmeter (60°)	BGD 518/S Curve Glossmeter (60°)	BGD 515/S Tri-Glossmeter (20°, 60°, 85°)
Measuring Range	0 ~ 300 GU	0 ~ 1000 GU	20° /60° : 0 ~ 1000 GU 85° : 0 ~ 160 GU
Measuring Aperture,mm	9×15	1.5×2	20° : 10×10 60° : 9×15 85° : 5×36
Resolution, GU	0.1		
Repeatability, GU	±0.2%		
Reproducibility, GU	±0.5%		
Accuracy, GU	±1.5		
Response Time, s	0.5 s		
Overall Size (L×W×H)	160mm×75mm×90mm		
Net Weight, g	350		
Power Supply	3200mAh Li-ion Battery, >10000 times (within 8 hours)		
Come With	Power Adapter, USB cable, User Manual, Software CD, Calibration Plate (built-in glossmeter)		



BGD 513 Basic Glossmeter (60°)



Introduction

BGD 513 Basic Glossmeter uses plastic shell and one-body standard board. It can be used in many fields as below:

- All kinds of coating and finishing surfaces, such as paints, varnishes, printing ink, etc.
- Decorative materials, such as marble, granite, polishing brick, ceramic tile and so on.
- The other kinds of materials and objects, such as plastic, woodenware, paper, etc.

At the same time, it has better characters comparing with old types:

- ◆ Small, Smart, Stable.
- ◆ Simple to use.
- ◆ A single battery only. AA size, Rechargeable or alkaline.
- ◆ The knob protector for operating with ease.

Characters

- ◆ Conform ISO 2813, ASTM D 523, ASTM D 2457 etc
- ◆ Calibrate automatically and operate by one button, simple to use
- ◆ One type of design, standard board as base, small size for portable
- ◆ Come with blue-tooth and software, convenient to transmit and save datas
- ◆ A single battery (AA alkaline or rechargeable) can last 60 hours.
- ◆ Vprotect measuring window by special scratch-resist coatings to avoid scratching by samples.

Common Angle

60° : can be used in all surfaces



Low Energy Consumption

1pc No.5 AA alkaline battery, can be used for almost 58 hours



Easy To Use, Stable Performance

Simple use, easy maintenance and stable performance
Indication Error: ± 1.2 GU

After Service

One year warranty and lifelong maintenance

Technical Parameters

- ★ Reading Range: 0.0 ~ 199.9 GU
- ★ Indication Error: ≤ 1.2 GU
- ★ Zero Error: ≤ 0.2 GU
- ★ Stability: ≤ 0.4 GU
- ★ Spot Size: 20mm × 10mm
- ★ Measuring Window Size: 30mm × 14mm
- ★ Incidence Angle: 60 Deg.
- ★ Volume (L × W × H) : 123mm × 38mm × 65mm
- ★ Net Weight: 300g
- ★ Power Supply: DC: 1.2 ~ 1.5; One AA-size battery
- ★ Ordering Information:
- BGD 513/1--- Intelligent Glossmeter (0.1 GU)
- BGD 513/2--- Intelligent Glossmeter (1.0 Gu)

BGD 514 Intelligent Touch-screen Glossmeter



Introduction

BGD 514 Intelligent Touch-screen Glossmeter is developed for foreign market. It has many characteristics such as precise measurement, powerful function, stable performance, easy operation and the following features:

Features:

- ◆ Conform Standards: ISO 2813、ISO 7668、ASTM D 523、ASTM D 2457、DIN 67530、JIS Z 8741、BS 3900、BS 6161 etc.
- ◆ 3-inch color touch screen with high resolution, clear display and sensitive response. The interface is intuitive and easy to use, and users can quickly enter different menu modes.
- ◆ Calibration Automatically: When turn on the glossmeter, it will measure standard board automatically and finish calibration.
- ◆ Intelligent USB port, charging and data transmission are integrated, without any software installation. The measurement data is stored in EXCEL form, and users can transfer to the computer or mobile phone at any time. Simple operation, convenient and fast.
- ◆ With data storage and querying functions: Super capacity for data storage space, can store one million groups data, and can store for 20 yeas.
- ◆ Multifunction: Can set any measuring times for one sample and calculate its average value, set auto shut-off time, buzzer etc.
- ◆ Multilingual: Chinese, English, Arabic, Portuguese, Spanish, Russian, French
- ◆ Many measuring angle modes for choose: Single angle measuring mode (20° or 60° or 85 °) and multi angle measuring mode (20° & 60° or 60° & 85° or 20° 、 60° 、 85°)
- ◆ Low power consumption design: When fully charged, the screen is adjusted to 100% brightness and can be used continuously for up to 10 hours. The screen is adjusted to 50% brightness and can be used continuously for up to 12 hours.
- ◆ With built-in rechargeable lithium battery, it is economical and environmentally friendly.
- ◆ Come with calibration certificate.
- ◆ After service: One year warranty and lifelong maintenance.

BGD 514/3		
	Gu	$\overline{Gu}$
20°	90.5	90.5
60°	94.6	94.6
85°	99.6	99.6

Main Menu



Multi angle measurements can be done with one-key operation



Type-C port
User can export the measurement data to computer or mobile phone at any time

Time	Group	Coast	Total	20°	60°	85°
1	0:06:00	1	1	90.1	94.1	98.1
2	0:06:00	1	2	90.1	94.1	98.1
3	0:06:11	1	3	90.1	94.1	98.1
4	0:06:11	1	4	90.1	94.1	98.1
5	0:06:11	1	5	90.1	94.1	98.1
6	0:06:11	1	6	90.1	94.1	98.1
7	0:06:21	2	1	90.1	94.1	98.1
8	0:06:21	2	2	90.1	94.1	98.1
9	0:06:21	2	3	90.1	94.1	98.1
10	0:06:21	2	4	90.1	94.1	98.1
11	0:06:21	2	5	90.1	94.1	98.1
12	0:06:31	3	1	90.1	94.1	98.1
13	0:06:42	3	2	90.1	94.1	98.1
14	0:06:42	3	3	90.1	94.1	98.1
15	0:06:42	3	4	90.1	94.1	98.1
16	0:06:42	3	5	90.1	94.1	98.1
17	0:06:42	3	6	90.1	94.1	98.1
18	0:06:57	4	1	90.1	94.1	98.1
19	0:07:06	4	2	90.1	94.1	98.1
20	0:07:06	4	3	90.1	94.1	98.1
21	0:07:06	4	4	90.1	94.1	98.1
22	0:07:16	5	1	90.1	94.1	98.1
23	0:07:16	5	2	90.1	94.1	98.1
24	0:07:16	5	3	90.1	94.1	98.1
25	0:07:21	5	4	90.1	94.1	98.1
26	0:07:21	5	5	90.1	94.1	98.1
27	0:07:27	6	1	90.1	94.1	98.1
28	0:07:39	6	2	90.1	94.1	98.1
29	0:07:39	6	3	90.1	94.1	98.1
30	0:07:39	6	4	90.1	94.1	98.1

Technical Parameters

- ★ Measuring Range: 0 ~ 199.9 ~ 2,000 GU
- ★ Accuracy: $\leq \pm 1.2$ GU
- ★ Zero Error: $\leq \pm 0.1$ GU
- ★ Stability: ≤ 0.2 GU/30min
- ★ Annual Variation of standard board: $\leq \pm 0.5$ GU
- ★ Measuring Area: 20°: 8.5mm × 10mm; 60°: 16mm × 10mm;
85°: 35mm × 5mm
- ★ Power Supply: A 18650 lithium battery
- ★ Dimension: 160mm × 50mm × 90mm (including holder, L × W × H)
- ★ Weight: 400g
- ★ Ordering Information:
BGD 514 /1 ---Intelligent Touch-screen Glossmeter (60°)
BGD 514 /3 ---Intelligent Touch-screen Glossmeter (20° /60° /85°)

BGD 516 Intelligent Glossmeter



Introduction

BGD 516 series intelligent glossmeter is a kind of classical product with powerful functions, stable performance, high accuracy, simple use and maintenance. It can be used not only to measure the gloss of coating materials such as coatings and inks, but also to measure the surfaces of stone, ceramic tiles, profiles, paper, woodenware, plastics, films and metals, and can completely replace imported similar products.

◆ Conforms to the standards: ISO 2813, ISO 7668, ASTM D 523, ASTM D 2457, ASTM C 584, DIN 67530, BS 3900 D5, etc

◆ Starting-up self-diagnosis: It can promptly detect problems such as system errors, the abnormal surface state of a calibrating standard and an improper operation, etc., and give a prompting message. It also allows user to modify the calibrating standard value which is traceable to complete the periodic calibration.

◆ Specially designed scroll wheel is easy to use, let the user enter different operation menu quickly.

◆ Menu options presetting: Angle mode, standby time, the size of measuring group, etc.

◆ Memory: Up to 10,000 measured data or 999 groups of data can be stored.

◆ For dual-glossmeter and tri-glossmeter, multi angle measurements can be done and displayed at the same time with just one-key operation.

◆ Parameters can be displayed directly, such as the current measurement frequency, the current values measured and the averages of the group respectively.

◆ Eight languages including Chinese, English, German, French, Italian, Spanish, Portuguese and Russian can be selected as the display language.

◆ The meter can not only measure the gloss value, but also measure the haze equivalent to ASTM D 4039 (suitable for dual-glossmeter and tri-glossmeter).

◆ Instant deletion of invalid measurement: Press and hold on the measuring key (for about 2 seconds) to delete the last measurement data, invalid data usually due to mis-operation in the current measurement group.

◆ Prompts for operation: The meter is provided with functions such as prompt for storage full, self-diagnosis error and low battery. With the cable accessory, the meter can be connected to a computer conveniently.

◆ Bluetooth connection is provided for easy connection between the meter and a computer or the mobile device, not only extending functions, but also implementing intelligent measurement operation and production automation.

◆ The gloss data processing software (Windows version) is provided for free. With the software, users can preset parameters of the meter easily. Meanwhile, measured data stored in the meter can be uploaded to a computer for storage and processing, etc.

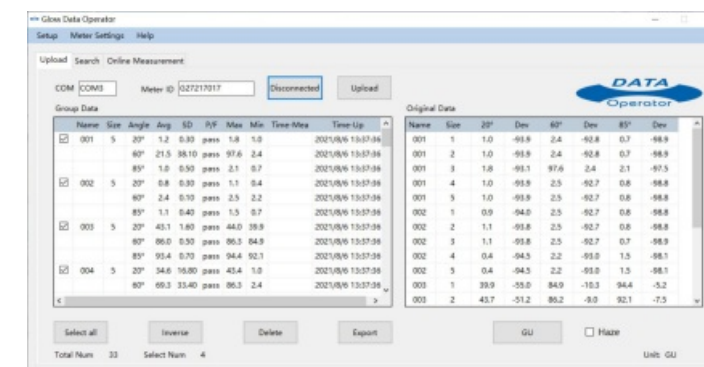
◆ Free mobile software (Android version): With the software, the meter can be operated cooperatively with the mobile for online measurement, setting and data uploading, etc.

◆ Free mobile software (Android version): With the software, the meter can be operated cooperatively with the mobile for online measurement, setting and data uploading, etc.

◆ A single AA (LR6) battery, either alkaline or rechargeable battery is used for power supply. It has the features of low energy consumption, easy battery replacement, convenient carrying and mailing.

◆ Free warranty for one year and permanent maintenance. Provide technical support for gloss measurement.

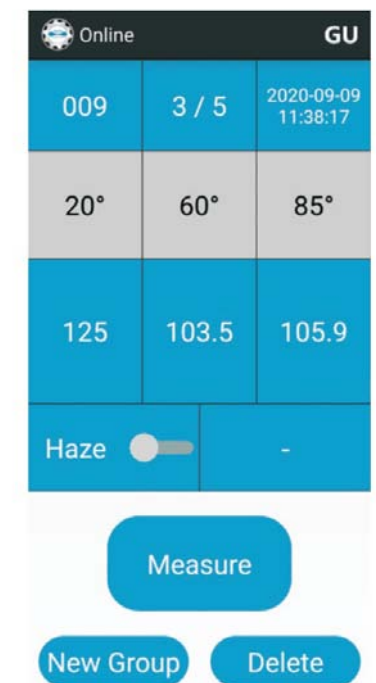
◆ Come with calibration certificate.



Software (Windows version)

Main Technical Parameters:

- ★ Measuring range: 0~119.9~2,000.0 GU
- ★ Resolution: ± 0.1 GU
- ★ Accuracy: ± 1.5 GU
- ★ Stability: ± 0.4 GU/30min
- ★ Power Supply: One AA-sized battery, rechargeable or alkaline
- ★ Voltage supply: 1.2V~1.5V
- ★ Measuring Area: 9mm $\times$ 10mm (20°); 9mm $\times$ 16mm (60°); 5mm $\times$ 39mm (85°)
- ★ Measuring Window: 12mm $\times$ 28mm (20° & 60°); 12mm $\times$ 60mm (85°)
- ★ Dimensions: 155mm (L) $\times$ 48mm (D) $\times$ 75mm (H)
- ★ Weight: 400g
- ★ Ordering Information:
 - BGD 516/1--- Intelligent Glossmeter (60°)
 - BGD 516/2--- Intelligent Dual-Glossmeter /Haze Glossmeter(20° / 60°)
 - BGD 516/3--- Intelligent Tri-Glossmeter (20° /60° /85°)

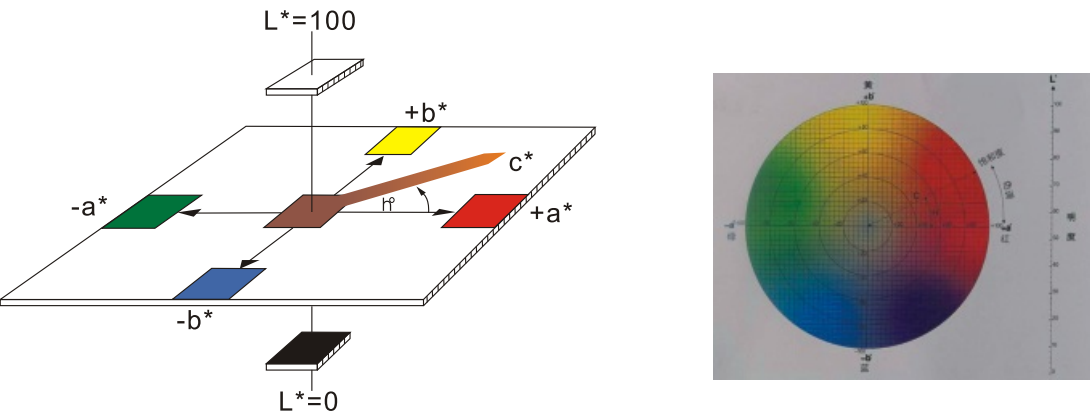


Bluetooth connection

COLOR

The human eye is capable of differentiating several million colors, despite this subjective visual evaluation, when used for quality control purpose, is no longer preferred as it suffers from a lack of real quantifiable data and inconsistent documentation. Since the early 1930's many scientific measuring techniques have been developed by National Standard Organisations, among them the CIE (International Committee of Light) , based on a logical numeric scaling where physical parameters and calculations have been clearly defined, universally accepted and adopted. As a result, many methods are today perfectly proven, and governed by major standard such as ASTM, BS,DIN, or ISO etc.

Colorimeters use the mathematically defined light sources and observers described above to measure colors under precisely defined measuring geometries and output the requested data to their display, printer or computer.



BGD 551 Economic Portable Colorimeter



Introduction

BGD 551 Economic Portable Colorimeters offer a simple and fast measurement for color difference between two samples. It's a highest cost performance colorimeter and very suitable for QC inspection of production and construction site.

- ◆ Double Locating: Illuminating locating and cross locating
- ◆ Double Measurement End Face: Large area measurement and small area measurement
- ◆ New Integrating Sphere Design: More stable measurement
- ◆ Equipped with Rechargeable High-Capacity Li-ion Battery

Feature and Advantages

- ◆ Built-in white plate parameters. No need to calibrate each time which realize rapid measurement.
- ◆ Double Locating: Illuminating locating and precise cross locating.
- ◆ Switchable Double Measurement End Face: Large stable end face and small concave-convex end face.
- ◆ New Integrating Sphere Optical Path Design: Eliminating the stray light of main optical path and auxiliary optical path. Possessing the highest measurement stability and precision.
- ◆ 4mm Measuring Aperture.
- ◆ Equipped with rechargeable high-capacity Li-ion battery. No need to purchase battery repeatedly.
- ◆ Configure CQCS3 software. Connect PC computer to realize more functions.
- ◆ Having got SCM Metrological Certification, CE Certification, and ISO9001 Quality Management System Certification.
- ◆ Hand-head structure: small and convenient; make the measurement easier.
- ◆ Spending huge sums on high-end mold. Product consistency approaches 100%.
- ◆ High cost performance: large output, good quality, cheap products.

Technical Parameters	
Illuminating/Viewing Geometry	8/d
Measuring Aperture	Φ4mm
Detector	Silicon photoelectric diode
Locating	Illuminating Locating/Cross Locating
Measurement End Face	Large stable end-face and small concave-convex end-face
Color Space	CIEL*a*b*C*h* ; CIEL*a*b* ; CIEXYZ
Color Difference Formula	ΔE*a b ΔL*a*b* ΔE*C*h*
Light Source	D65
Light Source Device	LED blue light excitation
Errors Between Each Equipment	≤0.80ΔE*a b
Storage	100pcs standards; 20,000pcs samples
Repeatability	Standard deviation within ΔE* a b 0.08 (Average of 30 measurements of standard white plate)
Language	English/Chinese
Weight	500g
Dimension	205mm × 67mm × 80mm
Power source	Rechargeable lithium-ion battery 3.7V@3200mAh
Lamp Life	3 years, more than 1.6 million measurements
Charging Time	8 hours---100% electricity
PC Software	CQCS3 Software
Optional Accessories	BGD 1390--- Special test box for powder BGD 1393--- Mini Printer

◆ **Ordering Information:** BGD 551--- Economic Portable Colorimeter

BGD 555/556 Precise Computer Colorimeter



Introduction

BGD 555 & 556 Precise Computer Colorimeter have adopted multi-channel color sensors of international brands, more stable IC platform as well as efficient and accurate algorithms to provide users with accurate and fast color management and application. They are also designed with ergonomics and humanized operation and have applied for a number of patents. BGD 555& 556 are multifunctional colorimeters with high quality and competitive price. BIUGED insists on independent research whose technology innovation is unique in color management field. These colorimeters are the most convenient colorimeters for users

◆ Leading Humanity Design and Convenient Operation

- ★ Auto White and Black Calibration at Startup (only for BGD 556)
- ★ Structure Design in line with Ergonomics
- ★ Fool-style Operation Interface.

◆ Stable Measurement Performance

- ★ The average fluctuation of ΔE is less than 0.06, actually more in 0.03~0.05.
- ★ Portable structure design which is more conducive to keeping the instrument stable when using.

◆ Flexible and Accurate Locating

- ★ Camera locating can solve the problem of locating a small area. The minimum width of locating is 4mm (only for BGD 556)
- ★ Illumination locating is a fast, simple and convenient locating function which is the original function by Biuged.



Camera locating
Illumination locating



Built-in White Plate
Automatic Calibration at Startup



Extended Aperture (Optional)
Available for measuring concave surface



Configuring 8mm & 4mm apertures

◆ PC Software Realize More Function Expansion

- ★ BIUGED has the intellectual property of PC software. The corresponding software serial number and password protection are configured in 3nh colorimeter.
- ★ Be able to perform color difference analysis, color difference cumulative analysis, chromaticity index, color Sample database management, simulating object color, etc.

◆ Advanced Power Management Design

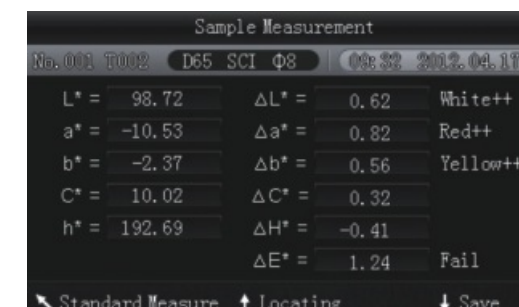
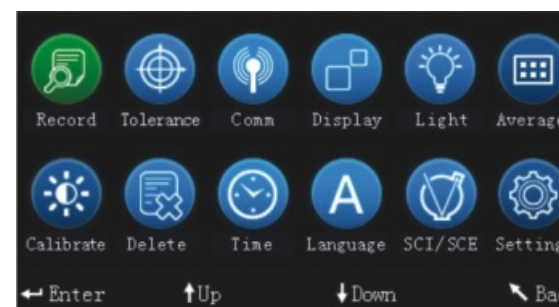
- ★ BIUGED is the first enterprise using high capacity Li-ion battery in colorimeter.
- ★ BIUGED Li-ion battery can be repeatedly charged which will save cost. Meanwhile, it can measure more than 3000 times on one charge to ensure the stability of long time measurement.

◆ More Measurement Modes (Only for BGD 556)

- ★ Two measuring apertures for more circumstances.
- ★ Five color spaces for more color schemes selection.
- ★ Three light sources for more circumstances.
- ★ SCI & SCE measurement mode.



CQCS3 Software



Operation Menu



Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 555 Precise Computer Colorimeter	BGD 556 Precise Computer Colorimeter
Illuminating/Viewing Geometry	8° /d	
Measuring Aperture	Φ 8mm	Φ 8mm/Φ 4mm
Detector	Silicon photoelectric diode	
Color Space	CIEL*a*b*C*h* ; CIEL*a*b* ; CIEXYZ	CIEL*a*b*C*h* ; CIEL*a*b* ; CIEXYZ ; CIERGB ; CIEL*u*v* ; CIEL*C*h* ; Yellowness & Whiteness ; Color Fastness
Color Difference Formula	ΔE*a b ; ΔL*a*b* ; ΔE*C*h*	ΔE*a b ; ΔL*a*b* ; ΔE*C*h* ; ΔECIE94 ; ΔE hunter
Light Source	D65	D65 ; D50 ; A
Light Source Device	LED blue light excitation	
Errors Between Each Equipment	≤0.40ΔE*a b	
Storage	100pcs standards ; 20000pcs samples	
Repeatability (Average of 30 measurements of standard white plate)	Standard deviation within ΔE* a b 0.07	Standard deviation within ΔE* a b 0.06
Language	English/Chinese	
Weight	500g	
Dimension	205mm × 70mm × 100mm	
Power source	Rechargeable lithium-ion battery 3.7V@3200mAh	
Lamp Life	5 years, more than 1.6 million measurements	
Charging Time	8 hours--100% electricity	
Measuring Times Before Recharging	3000 times in 8 hours	
Operating Environment	-10~40℃, relative humidity 0~85% with no condensation	
PC Software	CQCS3 Software	
Data Interface	USB	
Optional Accessories	BGD 1390---- Special test box for powder BGD 1391---- Universal test components BGD 1392---- Φ8mm extended aperture, available for measuring concave surface (Only for BGD 556) BGD 1393---- Mini Printer	



BGD 557/558 Spectrophotometer



Introduction

BGD series spectrophotometer is a high-tech product independently developed by BIUGED with our own intellectual property rights. It is a kind of powerful functions spectrophotometer with stable performance and high accuracy, and is in the leading position in the field of portable spectrophotometer. Widely used in the fields of coatings, plastic, electronics, paints, inks, ceramics, textile, garment, printing and dyeing, paper, automobile, medical, cosmetics, food industries, scientific research institutions, school and laboratories.

Under the condition of d/8 geometrical optical illumination recommended by CIE, spectrophotometer can accurately measure the SCI and SCE reflectivity data of samples (including fluorescent samples). In a variety of color spaces, we can accurately measure and express various color difference formulas and color indices. With the help of this instrument, the operator can easily realize the accurate transmission of color, and can also be used as the detection equipment of the precise color matching system. The instrument is equipped with high-end color management software, which can be directly connected to computer to achieve more functional expansion. The instrument is also widely used in the quality control of color difference of various products.



BGD 557



Characters

- ◆ Aesthetic design perfectly combined with ergonomics structure.
- ◆ d/8 ° geometrical optics structure, comply with CIE No.15, ISO7724/1, ASTM E1164, DIN5033 standards.
- ◆ Applied combined LED light source with high life and low power consumption.
- ◆ ϕ 8mm aperture, suitable for more samples; can measure SCI and SCE at the same time;
- ◆ High electronic hardware configuration: 3.5 inch TFT true color capacitive touch screen, concave grating, 256 pixel dual array CMOS detector, etc.
- ◆ USB communication mode, more adaptable;
- ◆ The standard white board with abilities of super wear-resistant, stain-resistant and stable performance.
- ◆ Large storage capacity, can save more than 10000 test data.
- ◆ Two standard observer perspectives, multiple light sources modes, a variety of color systems, conform to a variety of standard chroma indexes, meet the needs of various customers for color measurement;
- ◆ Camera view locating system, help to position fast, simply and conveniently.
- ◆ PC software with powerful extension functions.



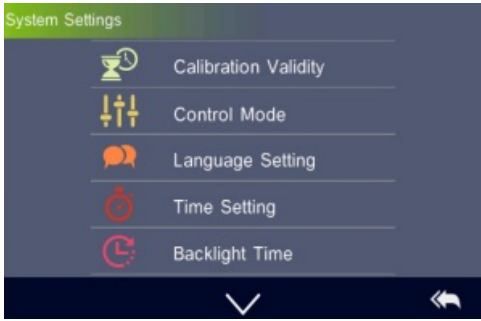
Main Menu



Sample Measurement



Color Space



System Settings

Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 557 Spectrophotometer	BGD 558/1 Spectrophotometer	BGD 558/3 Spectrophotometer
Illuminating/Observation System	45/0 method (45 ring-shaped illumination, vertical viewing), Comply with CIE No.15	d/8° （ Diffused illumination, 8° viewing angle ） SCI / SCE measurement (including specular reflection and eliminating specular reflection measurement mode), including UV / exclusion UV measurement; Conform to: CIE No.15, GB/T 3978,GB 2893,GB/T 18833,ISO7724-1, ASTM E1164,DIN5033	
Integrating sphere Size	Φ58mm	Φ48mm	
Light Source	Combined LED Source; UV Light Source （ Only for BGD 558/3 ）		
Spectroscopic Mode	— — —	Concave Grating	
Sensor	Silicon photodiode array	256-pixel dual-array CMOS image sensor	
Wavelength Range	400nm~700nm		

Wavelength Interval/ half-band width	10nm		
Reflectance Range	0~200%		
Illuminating/Measuring Aperture	Single Aperture; MAV (Big Aperture): ϕ 8mm/ ϕ 10mm	Single Aperture; MAV (Big Aperture): ϕ 8mm/ ϕ 10mm	Dual Apertures; MAV (Big Aperture): ϕ 8mm/ ϕ 10mm; SAV (Small Aperture): ϕ 4mm/ ϕ 5mm
Measurement Mode	SCE	SCI & SCE	
Color Space	CIE LAB, XYZ, Y × y, L C h, CIE LUV, Hunter LAB (Only for BGD 558)		
Color difference Formula	$\Delta E^*_{ab}, \Delta E^*_{uv}, \Delta E^*_{94}, \Delta E^*_{cmc(2,1)}, \Delta E^*_{cmc(1,1)}, \Delta E^*_{00}, \Delta E$ (Hunter and only for BGD 558)		
Other Chromaticity Data	WI: ASTM E313, CIE/ISO, AATCC, Hunter; YI: ASTM D1925, ASTM 313; TI: ASTM E313, CIE/ISO (Only for BGD 558) Metamerism Index MI; Color Stain; Color Fastness;		
Observer	2° /10°		
Illumination	D65, A, C, D50, D55, D75, F1, F2 (CWF) , F3, F4, F5, F6, F7 (DLF) , F8, F9, F10 (TPL 5) , F11 (TL 84) , F12 (TL 83/U30)		
Display Contents	Spectral Value/Graph, Colorimetric Value, Color Difference Value/Graph, PASS/FAIL Result, Color Offset, Color Simulation (Only for BGD 557)		
Measurement Time	1.5s	About 1.2s (If measure SCI/SCE at the same time, about 3s)	
Repeatability	Spectral reflectance: MAV/SCI, standard deviation within 0.1% (400~700nm: within 0.2%); Colorimetric value: Standard deviation within Delta E*ab 0.04 (white calibration plate measured 30 times at 5 seconds intervals after white calibration was performed.)	Spectral reflectance: MAV/SCI, standard deviation within 0.1% (400~700nm: within 0.2%); Colorimetric value: MAV/SCI, within ΔE*ab 0.04 (the average value of whiteboard which was measured 30 times at intervals of 5 seconds after calibration)	Spectral reflectance: MAV/SCI, standard deviation within 0.08% (400~700nm: within 0.18%); Colorimetric value: MAV/SCI, within ΔE*ab 0.03 (the average value of whiteboard which was measured 30 times at intervals of 5 seconds after calibration)
Inter Instrument Agreement	MAV/SCI, within ΔE*ab 0.2 (Average value of 12 pcs BCRA II series color tiles)	MAV/SCI, within ΔE*ab 0.2 (Average value of 12 pcs BCRA II series color tiles)	MAV/SCI, within ΔE*ab 0.15 (Average value of 12 pcs BCRA II series color tiles)
Measurement Mode	Single Measurement, Average Measurement (2~99 times)		
Locating Mode	---	Camera view locating system	
Size	90mm × 77mm × 230mm (L × W × H)	184mm × 77mm × 105mm (L × W × H)	
Weight	About 600g		
Battery	Li-ion battery. 5000 times within 8 hours	4 pcs No.5 alkaline batteries (AA alkaline battery); or USB interface as power.	
Lamp Life	5 years, more than 3 million measurement.		
Display Screen	3.5-inch TFT true color capacitive touch screen		
Interface	USB/RS-232; Bluetooth 4.0 Dual Mode (only for BGD 558/3, compatible with 2.1)		
Data Memory	1000 Standards, 15000 Samples	1000 Standards, 20000 Samples (A data can include both SCI and SCE)	1000 Standards, 28000 Samples (A data can include both SCI and SCE)
Operating Temperature Range	0~40℃, 0~85%RH (No condensation) , Elevation: Below 2000 m		
Storing Temperature Range	-20~50℃, 0~85%RH (No condensation)		
Standard Accessory	Power Adapter+Li-ion Battery (for BGD 557) or 4 pcs No.5 alkaline batteries (for BGD 558) , Data line, Operating Instruction, CD-ROM (containing management software) 、 White and black calibration cavity, Protective cover		
Optional Accessory	BGD 1390--- Special test box for powder; BGD 1395--- Universal test components BGD 1393--- Mini Printer		



BGD 1390
Special test box for powder



BGD 1393
Micro Printer



BGD 1395
Universal Test Components

BGD 559 Multi-Angle Spectrophotometer

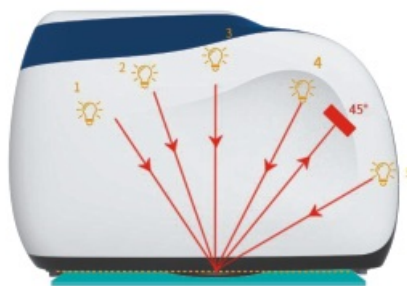


Introduction

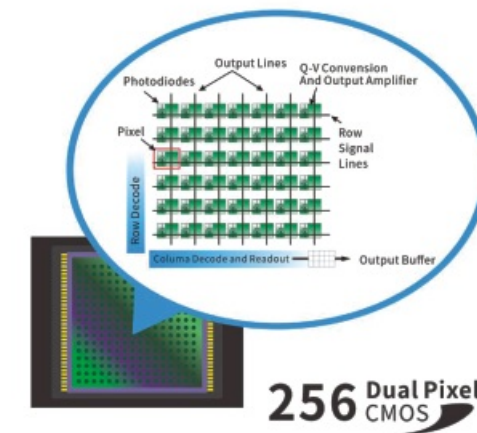
Introduction: **BGD 559 Multi-Angle Spectrophotometer** provides accurate and consistent color measurement for metallics, pearlescents and other complex special effect finished products. It adopts industrial-grade MCU and is equipped with 5 measuring angles. Under the superior performance of the optical measurement system, the instrument has excellent performance in multi-angle chromatic aberration measurement, even in the curved surface, but also has a high measurement accuracy and stability.

Characters

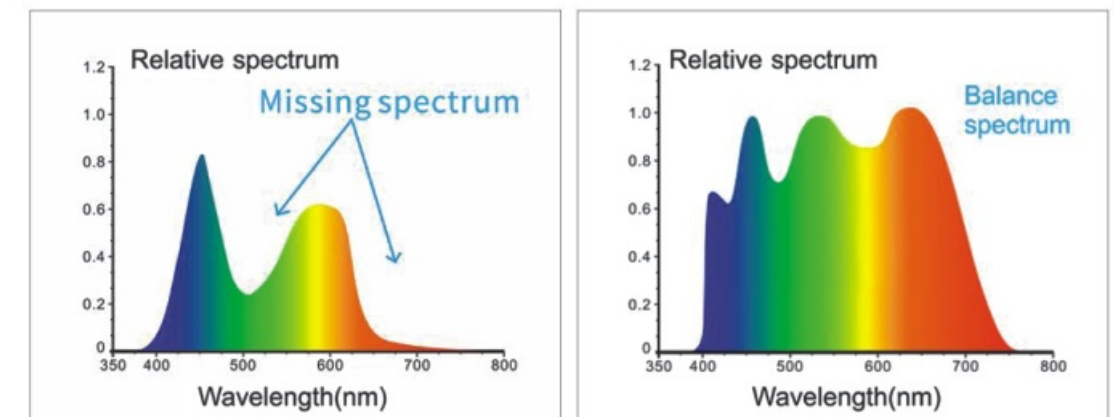
- ◆ Multi-angle measurement: Adopt 5 illumination sources, 1 receivers to measure 5 measurement angles at the same time.
- ◆ More intuitive display: Touch screen can display all angle measurement results, more intuitive view of the comprehensive data.



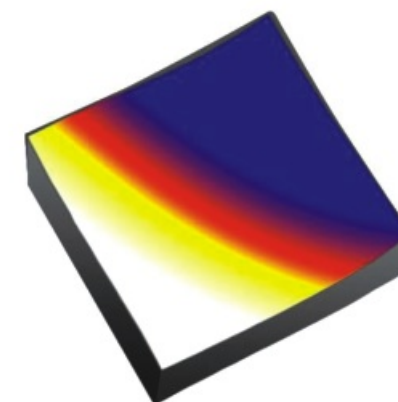
- ◆ 256 Image Element Double Array CMOS Image Sensor: The higher optical resolution ensures the measuring speed, accuracy, stability and consistency of the instrument. The core technology makes it as the same platform with international standards and complete compatibility.



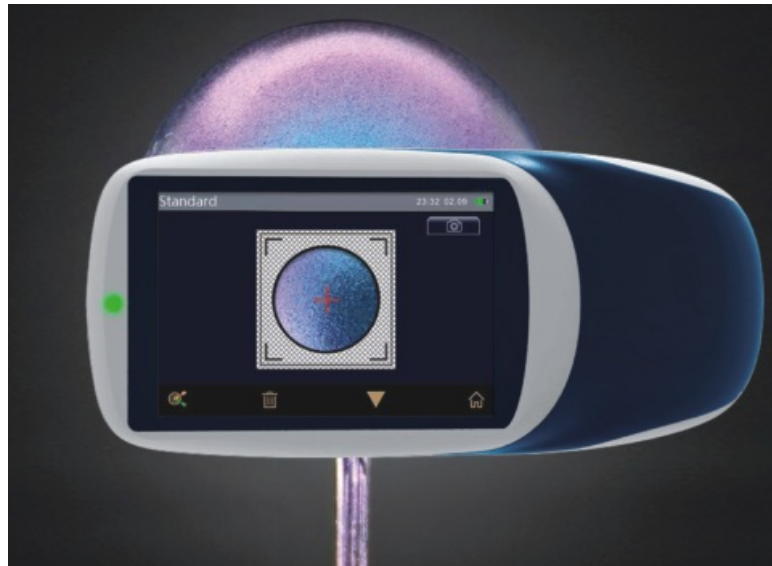
- ◆ Full spectrum LED light source with blue enhancement: It ensures sufficient spectral distribution in the visible light range, avoids the spectral loss of LED in a specific band, and ensures the accuracy of instrument measurement results and low cost maintenance.



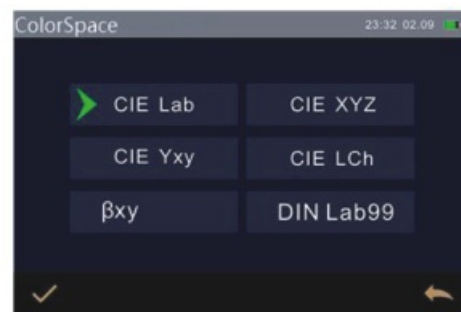
- ◆ Concave grating spectrophotometric technology: Higher resolution and more accurate color measurement.
- ◆ Professional-grade white board: High hardness in the surface, stable optical performance.



- ◆ Higher quality: Industrial grade real-time processing MCU, Bluetooth 5.0 transferring more stable and reliable.
- ◆ Ergonomics Novel and fashionable appearance design: The instrument is easy to operate, and the hand holding position and the measurement button are well-designed, which can meet different holding habits, smooth and fine surface, from the high-precision appearance treatment process.
- ◆ Built-in color camera positioning, can accurately judge the object measured position, and improve the measurement efficiency and accuracy.



- ◆ Multiple color measurement space, multiple observation light sources, which can meet the special measurement demand under different measurement conditions.



ColorSpace

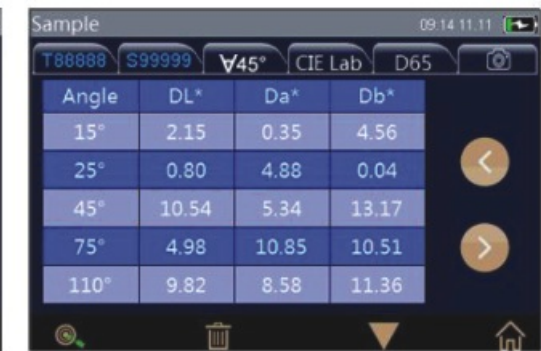


Illuminant

- ◆ Easily analyze data: The screen can intuitively display spectrum/data, sample chromaticity value, color difference value/figure, pass/fail results, color simulation, sample effect value, effect difference value and other data, convenient to view while also greatly improve the user's work efficiency.



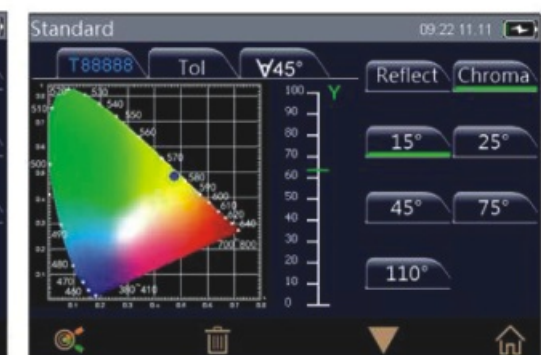
Color data



Color difference value



Color difference graph



Samples Chromaticity values

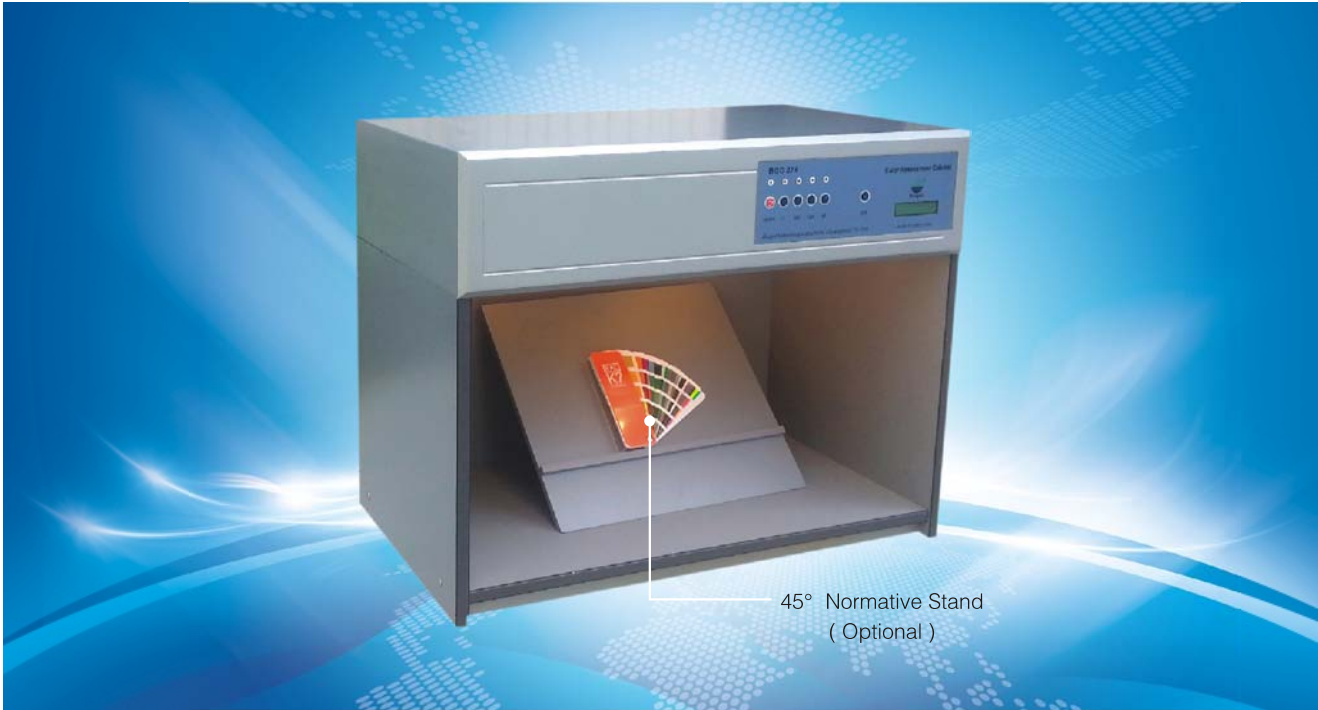
- ◆ Conform to standards: ASTM D2244, E308, E1164, E2194, E2539; DIN 5033, 5036, 6174, 6175-1, 6175-2; ISO 7724, 11664-4; SAE J 1545



Technical Parameters

★ Measure Angle: 45° Receiver, 45 as 15° , 45 as 25° , 45 as 45° , 45 as 75° , 45 as 110°
★ Light Source: Full spectrum LED light source with blue enhancement, the lifetime can reach 5 years or 3 million measurements.
★ Spectrophotometric Mode: Concave Grating
★ Sensor: 256 Image Element Double Array CMOS Image Sensor
★ Wavelength Range: 400nm–700nm
★ Wavelength Interval: 10nm
★ Semiband Width: 10nm
★ Measurement Range: 0~600%
★ Measuring Aperture: Φ 12mm
★ Color Space: CIE LAB, XYZ, Yxy, LCh, β xy, DIN Lab99
★ Color Difference Formula: ΔE*ab, ΔE*94, ΔE*cmc (2:1), ΔE*cmc(1:1), ΔE*00, DINΔE99, ΔE DIN6175
★ Observer Angle: 2° /10°
★ Illuminant: D65, A, C, D50, D55, D75, F1, F2 (CWF), F3, F4, F5, F6, F7 (DLF), F8, F9, F10 (TPL5), F11 (TL84), F12 (TL83/U30)
★ Display: Spectrogram/Values, Samples Chromaticity Values, Color Difference Values/Graph, PASS/FAIL Result, Color Offset
★ Measuring Time: Approx. 1 second for one angle, approx. 5 seconds for all angles
★ Repeatability: Spectral reflectance standard deviation within 0.08%
★ Chromaticity value: ΔE*ab 0.03 (When a white calibration plate is measured 30 times at 5 second intervals after white calibration)
★ Reproducibility: ΔE*<0.10, avg on the gray tile of BCRA tile set; ΔE*<0.25, avg on the color BCRA tile set
★ Inter–instrument Error: 0.2ΔE*00 (avg on reference Series II BCRA tile set)
★ Trigger Mode: Pressure sensing trigger, button trigger, software trigger
★ Measuring Mode: Single measurement, average measurement (1–99), continuous measurement (1–99)
★ Locating Mode: Color camera preview
★ Power: Lithium–ion battery, 3.7V, 3200mAh, Continuous test 6000 times within 8 hours of full charge
★ Display: 3.5–inch TFT color LCD, Capacitive Touch Screen
★ Interface: USB, Bluetooth 5.0
★ Data Storage: 1000 pcs Standards, 4000 pcs Samples
★ Language: Simplified Chinese, Traditional Chinese, English
★ Calibration: Built–in white board parameters, external white board, black light trap
★ Calibration Interval: 4 hours, 8 hours, 24 hours, Startup calibration
★ Dimension: 195mm×83mm×128mm (W×D×H)
★ Net Weight: About 1Kg
★ Standard Accessories: Power Adapter, USB Cable, User Guide, PC Software(download from the official website), Calibration Board, Black Light Trap, Protective Cap, Wristband
★ Optional Accessory: Micro–printer
★ Ordering Information: BGD 559/3---Tri–Angle Spectrophotometer (15° /45° /110°) BGD 559/5---Five–Angle Spectrophotometer (15° /25° /45° /75° /110°)

Color Assessment Cabinet



Introduction

The cabinets provide different lights and are controlled by a microprocessor LCD Screen that shows each Lighting usage Time. Each Button controls the individual set of Lights. The CLR (Clear) button allows the resetting of the Lighting Usage Time to ZERO when new lights are replaced. The ON/OFF Switch button must be switched off during long hours (more than 3 to 4 hours) of non-operation. This is to reduce the possibility of heat-up as well as to increase life span of the electronic ballast, All Lights can be switched on at the same time as according to the user needs The optional Diffused Glass Panel below the lights ensures the elimination of direct reflection of lights to viewing products, There is no Warm-Up time/Flickering of Lights when there is a constant electrical supply. All electrical components used are of low power consumption and heat generation for energy efficiency in.

The international approved Light Gray Non-Reflective Surface ensures that no light is being reflected from the surface during color matching, So, what you see of your products in our Biuged Color Assessment Cabinets will be as natural as what you view them under the natural color matching conditions. The Non-Reflective Surface has certain degree of roughness not only acts as light absorption when light are illuminated, but it is also scratched-resistance, Many Color-Matching Cabinets do not have this dual ability.

All Biuged Color Assessment Cabinets conform to ISO 3668, ISO 13076, ASTM D 1729

★ Light source :

Light source	Description	Number of Light	Power	Color Temperature
D65	International–standard Artificial Daylight	2 pcs	18W	6500K
TL84	Applicable to stores in Europe, Japan and China	2 pcs	18W	4000K
CWF	Cool White Fluorescent of America	2 pcs	20W	4150K
F/A	Comparison referential light source, Applicable to family/hotel	4 pcs	40W	2700K
UV	Ultraviolet light source	1 pc	18W	2856K
TL83 (U30)	Warm White Fluorescent of European Standards	2 pcs	18W	3000K

Technical Parameters

- ★ Time running display for each light source.
- ★ Auto conversion between light sources; Different spectrum with same color.
- ★ No need warm-up and no flicker, enable quick and reliable assessment to sample.
- ★ Low power-consumption; No heat emission; Efficient illumination.
- ★ Small size and convenient to use for laboratory or production line.
- ★ Weight: 35Kg
- ★ Dimensions: 710 mm × 410 mm × 570 mm

◆ Ordering Information

Light source → Ordering Information ↓	D65	TL84	F/A	UV	CWF	TL83 (U30)
BGD 274	✓	✓	✓	✓		
BGD 275	✓	✓	✓	✓	✓	
BGD 276	✓	✓	✓	✓	✓	✓

Optional accessories: BGD 277---45° Normative Stand (has accurate angles and has the same color as the Color Assessment Cabinet/this makes a non-interference viewing effect).

 **Biuged instruments also offer some special size (Dimensions: 1310x600x800 mm) color assessment cabinets according to customer's different demand.**

ISO, CNAS/ILAC, CE Certificates

